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Instructional Materials Reference Center
for Visually Handicapped Children

FINAL TECHNICAL REPORT -- Section II

November 30, 1974

Project No. 272036

Contract No. 720E7163, OEG 2-6-062289



ABACUSES

(with instructional manuals)



The Cranmer Abacus (with coupling device)

Manufactured by
American Printing House for the Blind
1839 Frankfort Avenue
P. O. Box 6085
Louisville, Kentucky 40206

THE CRANMER ABACUS

The Cranmer Abacus is a self-contained, pocket-sized calculating device with which one can add, subtract, multiply, divide, extract roots, handle decimals, fractions, and trigonometric functions — in short, most processes of arithmetic calculations. It is a variation of the standard Japanese Soroban, with one bead above the bar and four beads below. This variation has two distinct features which set it apart from other forms of the abacus. First, the operator can read it by touch without fear of upsetting his work. The beads have a small amount of pressure applied to them from behind by a foam-rubber pad, covered with felt, thus creating a slight friction. Second, adequate bead-spacing and travel-distance allow for easy operation.

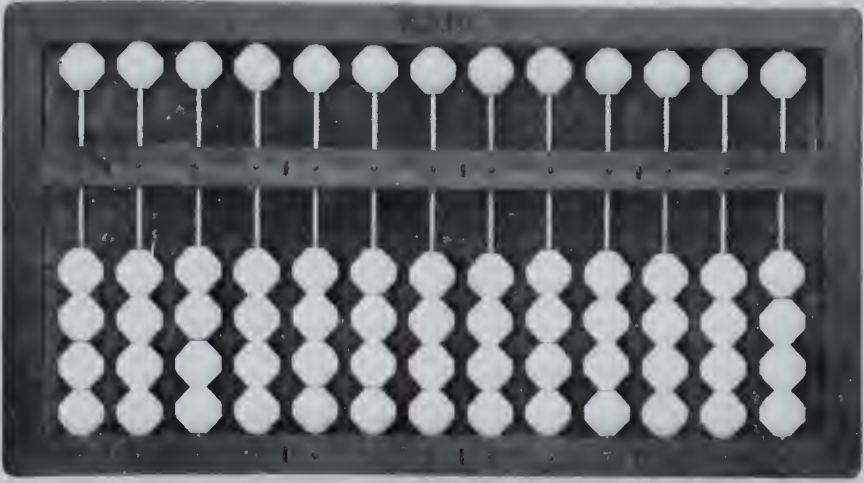
Physical dimensions of the Cranmer Abacus are: $3\text{-}9/32''$ high x $6\text{-}1/8''$ wide x $7/16''$ thick. It is a 13-rod Soroban, with a bead diameter of approximately $5/16''$. The frame is made of a high-impact, black polystyrene, while the beads are formed of rigid polyvinyl plastic.

For those who need more columns for their calculations, a coupling device is available which will link two single abaci together for this purpose. The Abacus Coupler is made of spring steel, cadmium plated to resist corrosion.

Operation of any abacus requires extended study and practice on the part of the operator. Two instruction books are available in both Braille and large type for this purpose from the American Printing House for the Blind. (A similar booklet in regular ink-print type, entitled *THE JAPANESE ABACUS*; its use and theory, by Takashi Kojima, priced at \$1.25, may be purchased from Charles E. Tuttle, Co., Rutland, Vt.)

LARGE ABACUS

The enlarged abacus is suggested for use by young visually handicapped students, and those who lack the skills required for easy manipulation of the smaller device. This large model may also be beneficial to the adult blind who have difficulty with manipulation and tactile discrimination.



The Large Abacus

The design of this abacus is similar to that of the Cranmer abacus. The beads have a small amount of pressure applied to them from behind by the rubber pad, thus creating a slight friction. The bead shape consists of two similar conical sections that are joined by a flat circular band approximately $\frac{1}{8}$ " wide. This design allows the user to place the thumb or finger against the beveled edge of the head. Finger and thumb contact of the bead is simplified, allowing for easier manipulation when setting the bead against the bar. Adequate bead-spacing and travel-distance allow for easy operation.

The physical dimensions of the large abacus are $4\frac{1}{2}$ " high, x $8\frac{1}{4}$ " wide, x $\frac{3}{4}$ " thick. The aid has 13 columns with one bead above the bar and four beads below it. The bead diameter is approximately $\frac{7}{16}$ ". The frame is made of a high-impact, black polystyrene, while the beads are formed of white polystyrene.

Catalog Numbers

Cranmer Abacus. 1-0315.

Coupling Device to accompany Cranmer Abacus. 1-0316.

Large Abacus. 1-0317.

Instructional Manuals:

THE ABACUS MADE EASY — by Mae Davidow:

Braille Edition—1 v. 5-0014.

Large Type Edition—1 v. 4-0015.

USING THE CRANMER ABACUS — by Fred L. Gissoni:

Braille Edition—1 v. 6-5010.

Large Type Edition—1 v. 4-2711.

APH NUMBER LINE DEVICE



Manufactured by

American Printing House for the Blind

1839 Frankfort Avenue

P. O. Box 6085

Louisville, Kentucky 40206

APH Number Line Device

The APH Number Line Device was developed by the Instructional Materials Reference Center of the American Printing House for the Blind for use by visually handicapped students working at the primary level. This Device can be used to present many of the concepts which are included in contemporary elementary school mathematics programs as well as to discover and reinforce mathematical concepts. The APH Number Line Device bridges a gap, between the concrete and the abstract.

The APH Number Line Device consists of three parts with the following physical dimensions:

(1) A base, $24\frac{1}{4}"$ x $6\frac{1}{2}"$ x $1\frac{3}{4}"$, with room for two line segments to be used simultaneously and a work storage area for the plastic solids.

(2) Ten interchangeable vinyl line segments, $20\frac{3}{4}"$ x $1\frac{1}{2}"$, white with a black raised line and large raised black dots at intervals indicated by both braille and print numerals as follows:

- | | | |
|------|-------------------|---|
| (1) | 0 - 20 by ones | |
| (2) | 0 - 200 by tens | |
| (3) | 0 - 100 by fives | |
| (4) | -10 - +10 by ones | |
| (5) | Halves |) |
| | |) |
| (6) | Thirds |) |
| | |) |
| (7) | Fourths |) |
| | |) |
| (8) | Sixths |) |
| | |) |
| (9) | Fractional tenths |) |
| | |) |
| (10) | Decimal tenths |) |
| | |) |
- Equivalent (One whole equals one foot.)
- Equivalent (One whole equals ten inches.)

(3) Forty plastic cylinders, 1" x 1/4" in diameter,
which serve as pegs and/or interlocking bars.
Manipulation and uses of the device are explained in detail
in the booklet Guide to the APH Number Line Device which
is included with the device.

Catalog Number — 1-0348.

BIOLOGICAL MODELS



Manufactured by

American Printing House for the Blind

1839 Frankfort Avenue

P. O. Box 6085

Louisville, Kentucky 40206

BIOLOGICAL MODELS

The Biological Models were developed by the Instructional Materials Reference Center of the American Printing House, as supplementary aids for teaching biology to blind students.

The biological models in this set emphasize, tactually, the most important biological features on simplified models and by eliminating braille captions and all raised lines which are not part of the model. Biological features are chromatically represented on a white background, where possible, to maximize color contrast for students with low levels of residual vision.

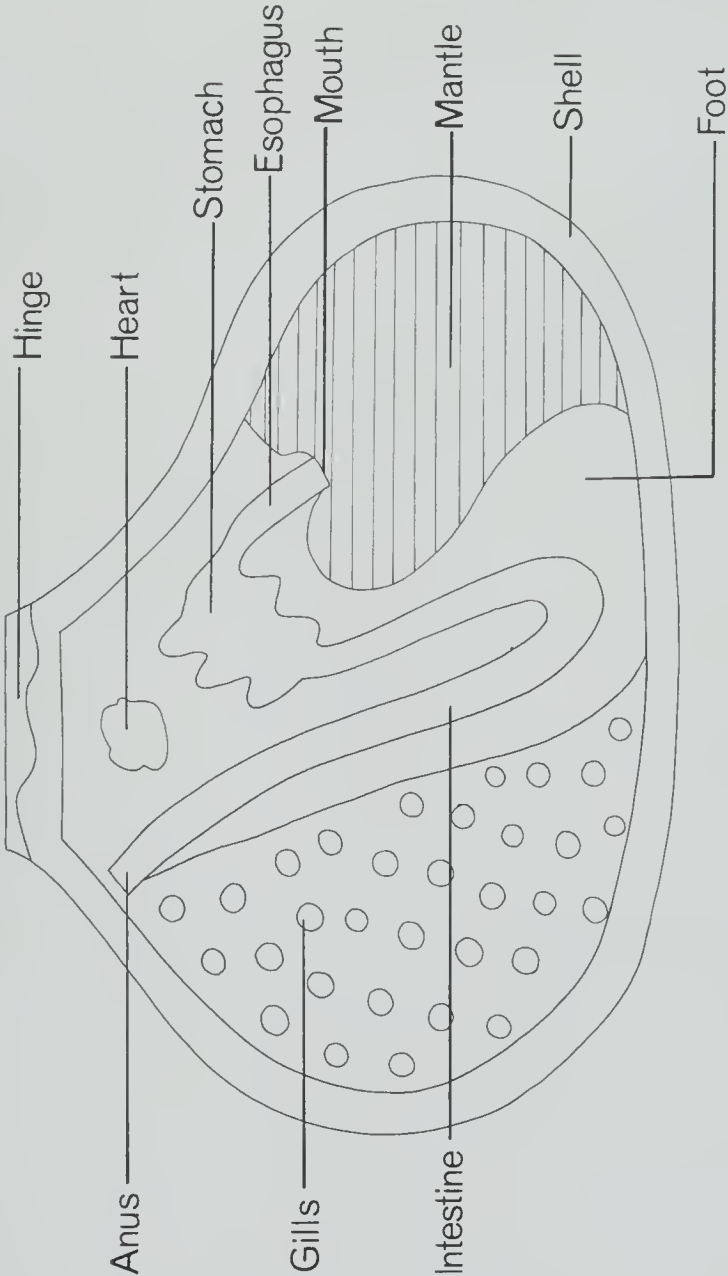
CONTENTS OF THE SET

The set consists of 19 rectangular-shaped models representative of invertebrate animal and plant phyla. Each model has a maximum rise of one inch and is no more than two hand-spans lengthwise. All models are constructed of 15 mil, high-impact styrene and are coded chromatically and tactually.

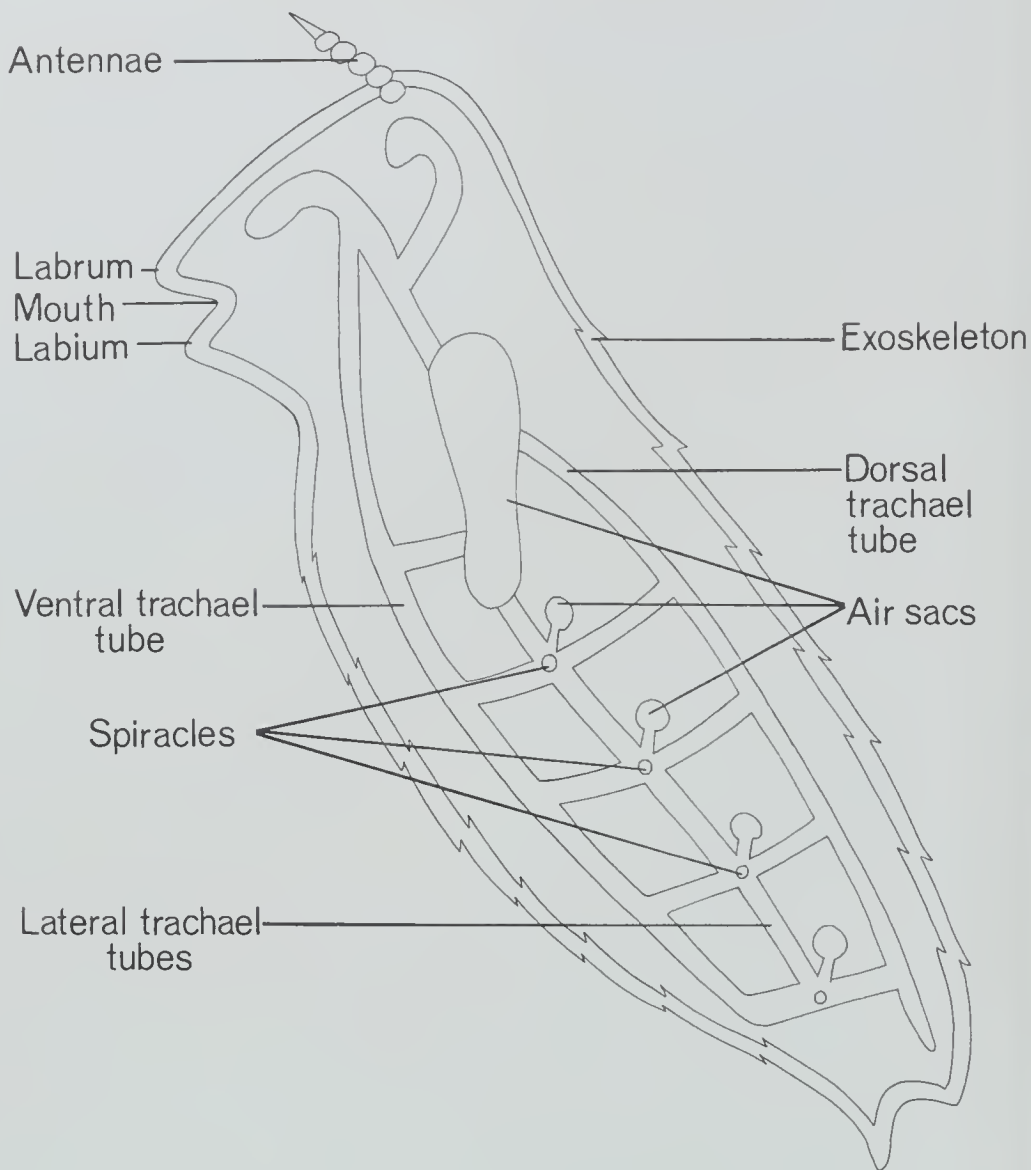
Individual sketches of each model are presented in the following section.

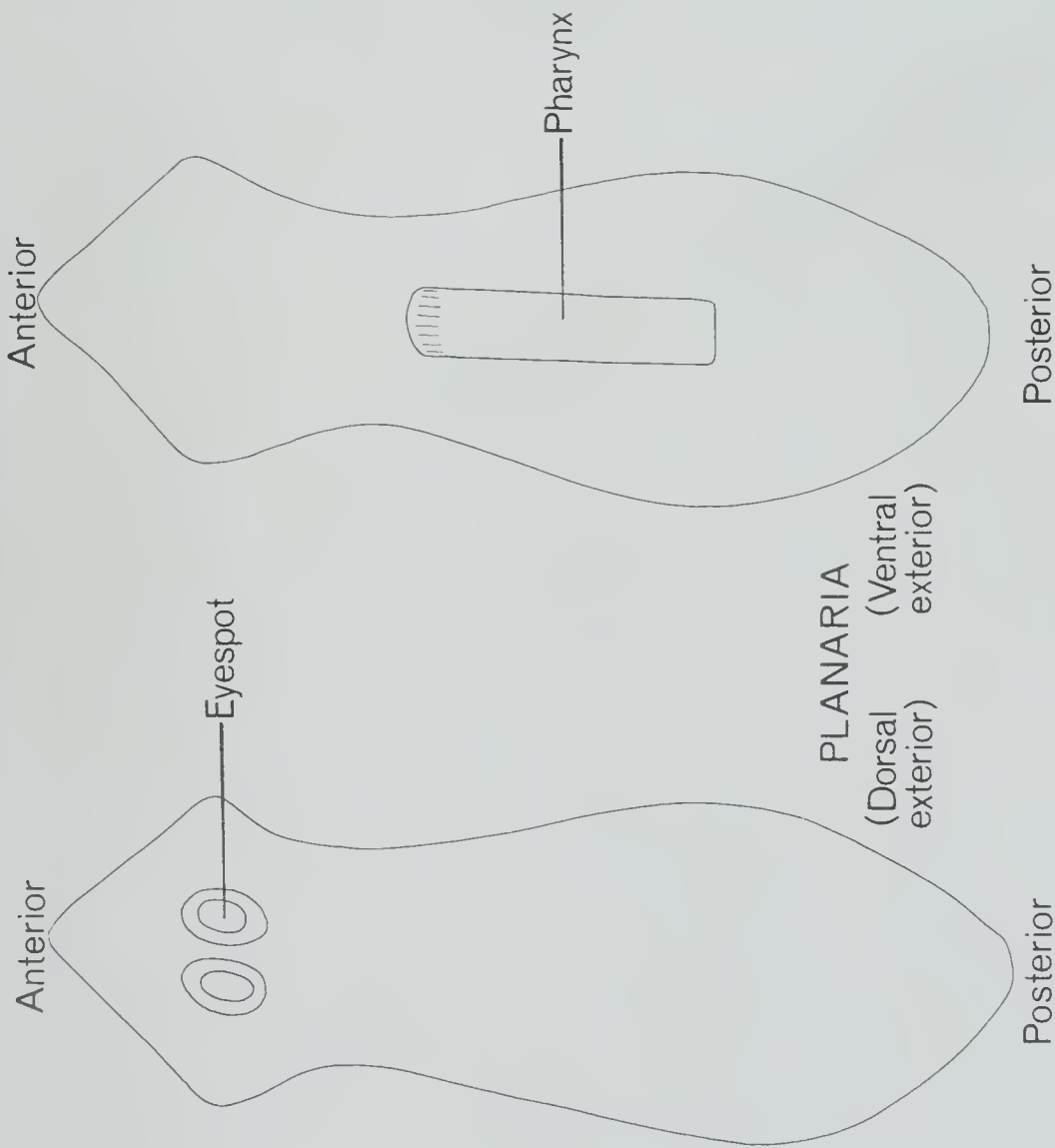
Catalog Number — 1-0301

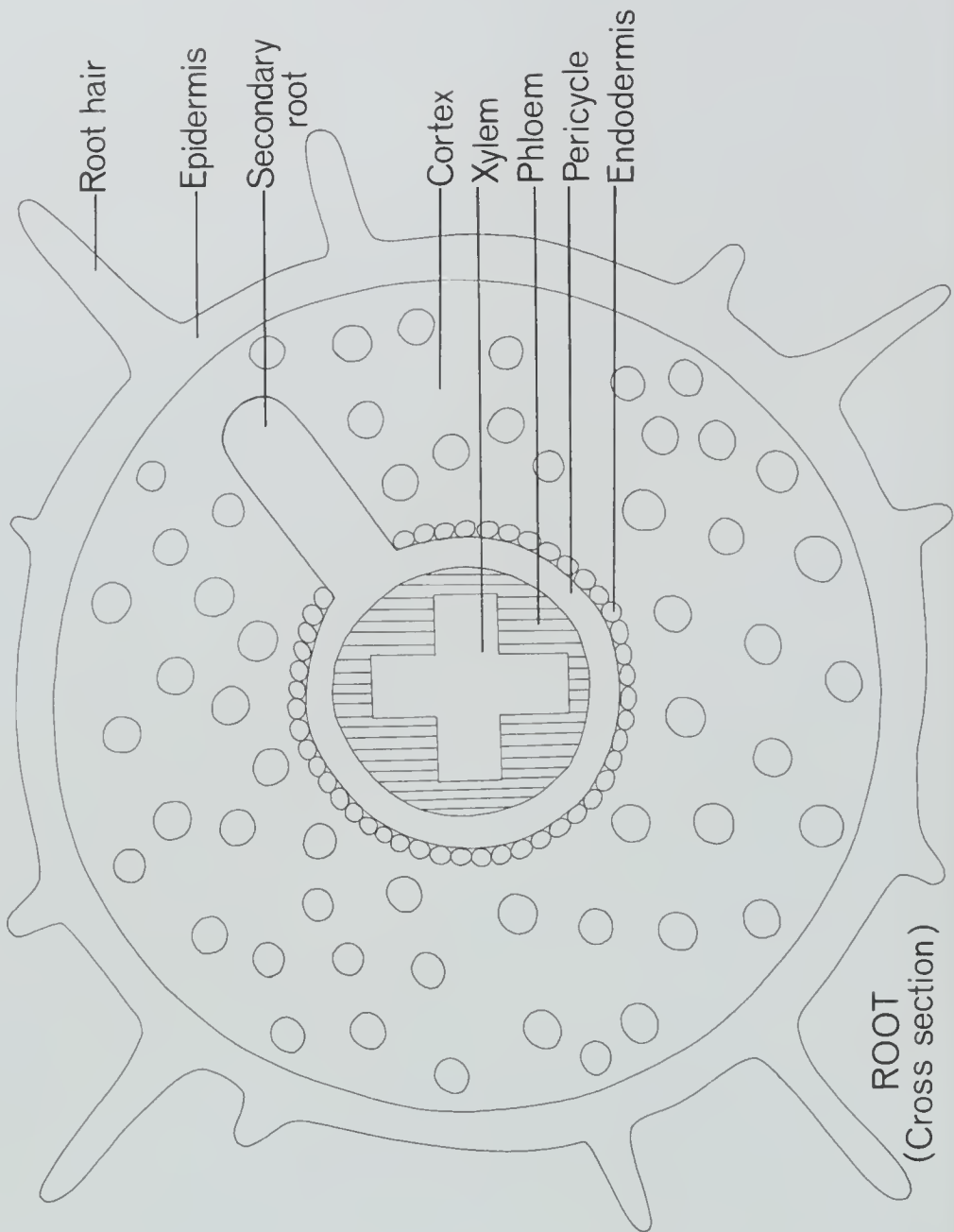
CLAM (Internal structure)



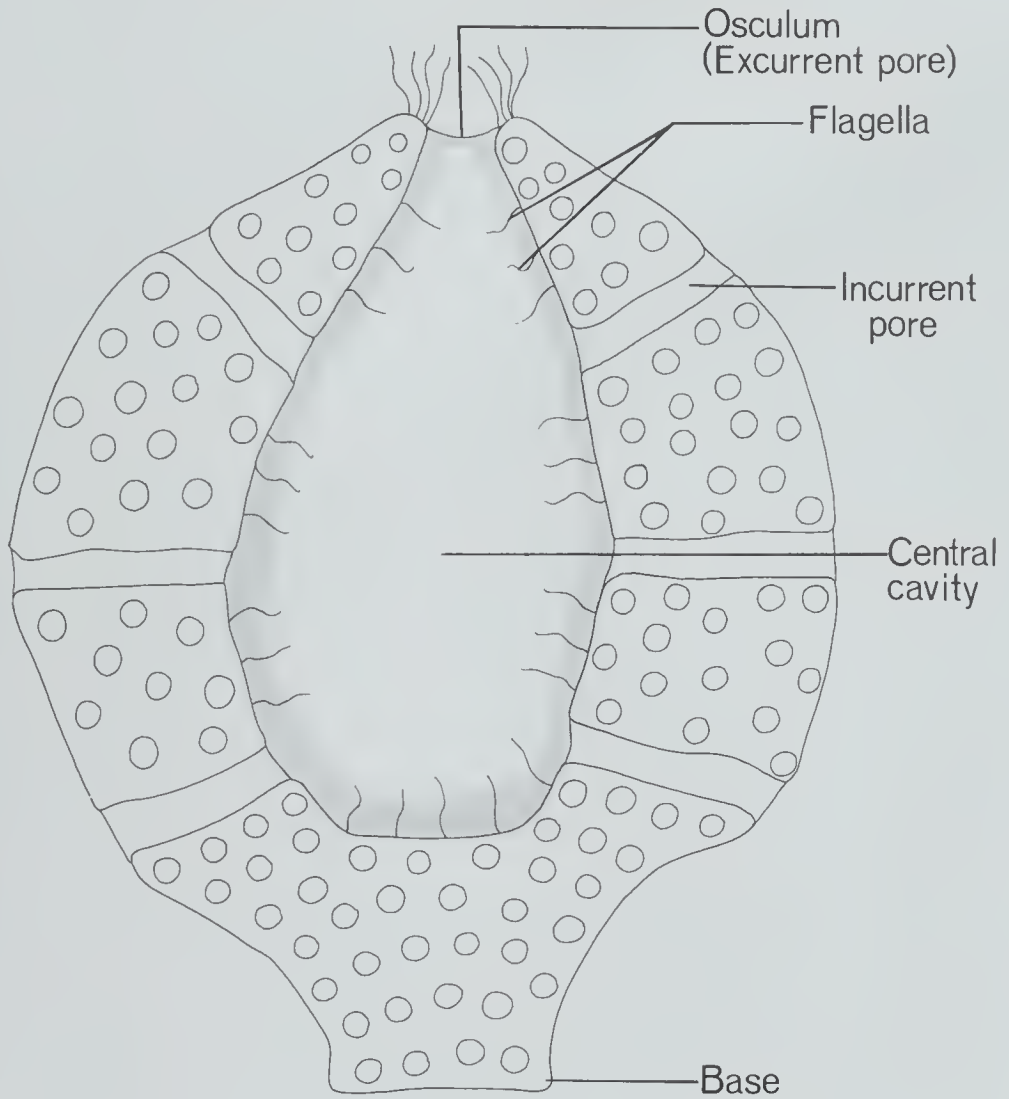
GRASSHOPPER (Trachael system)



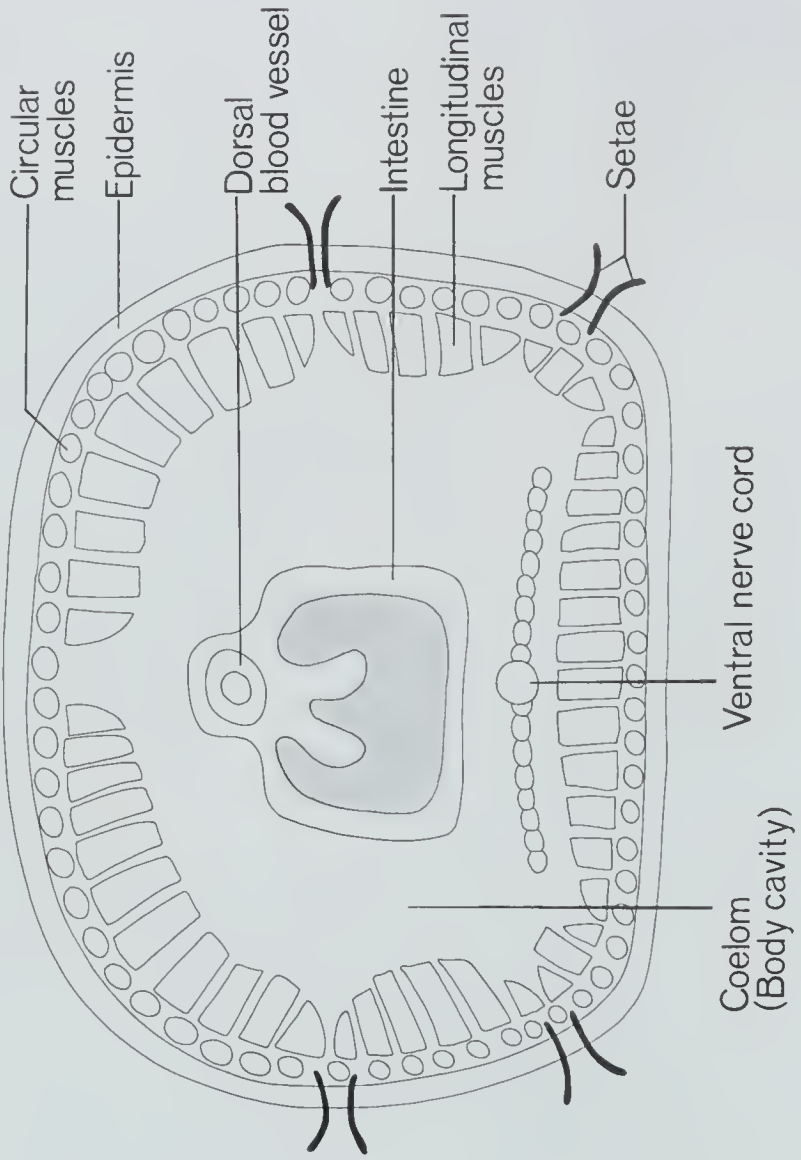


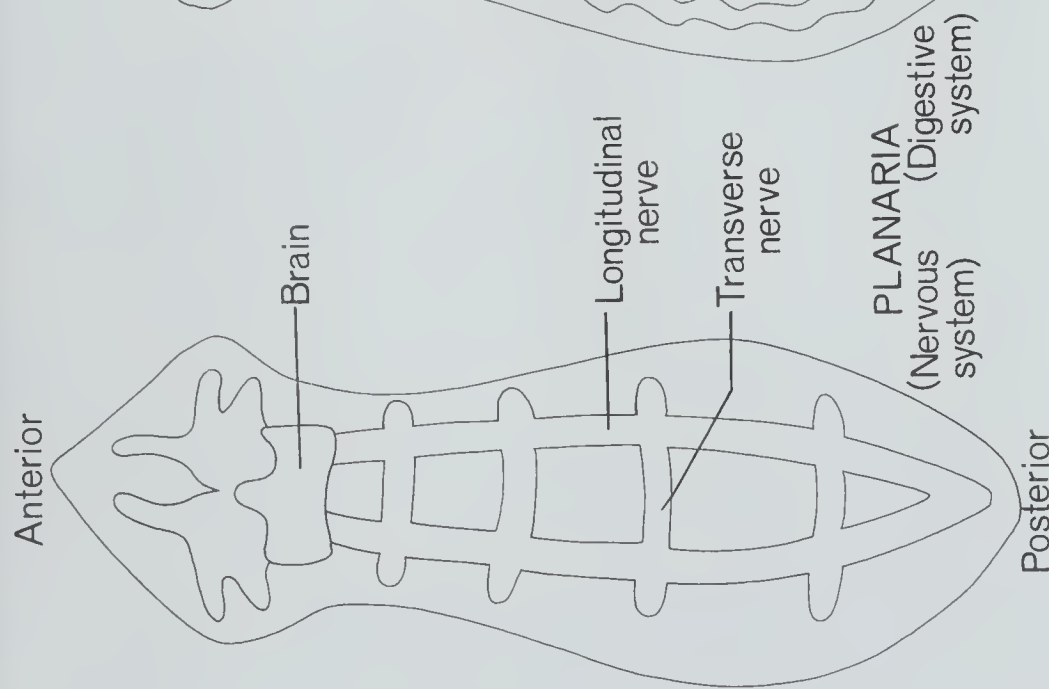
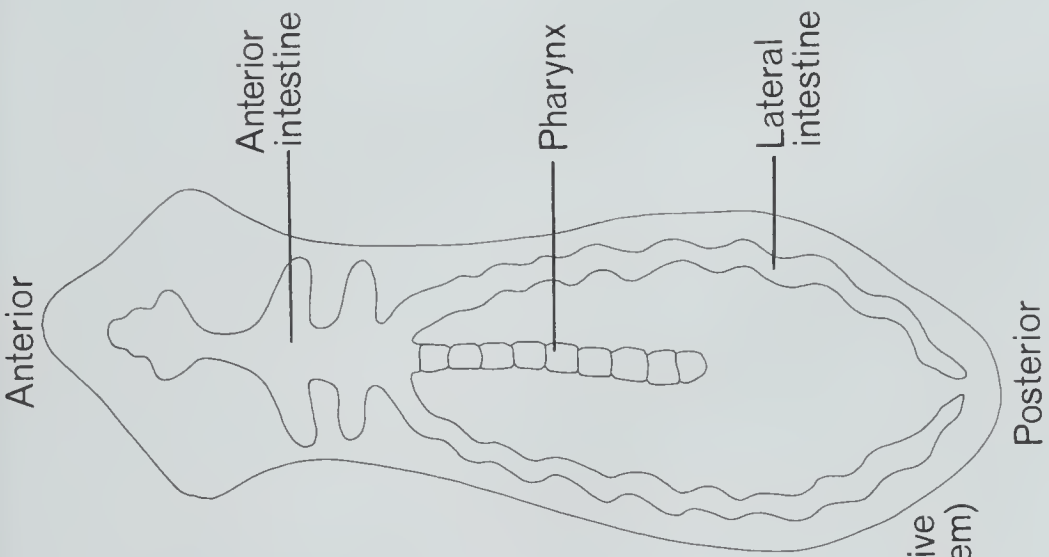


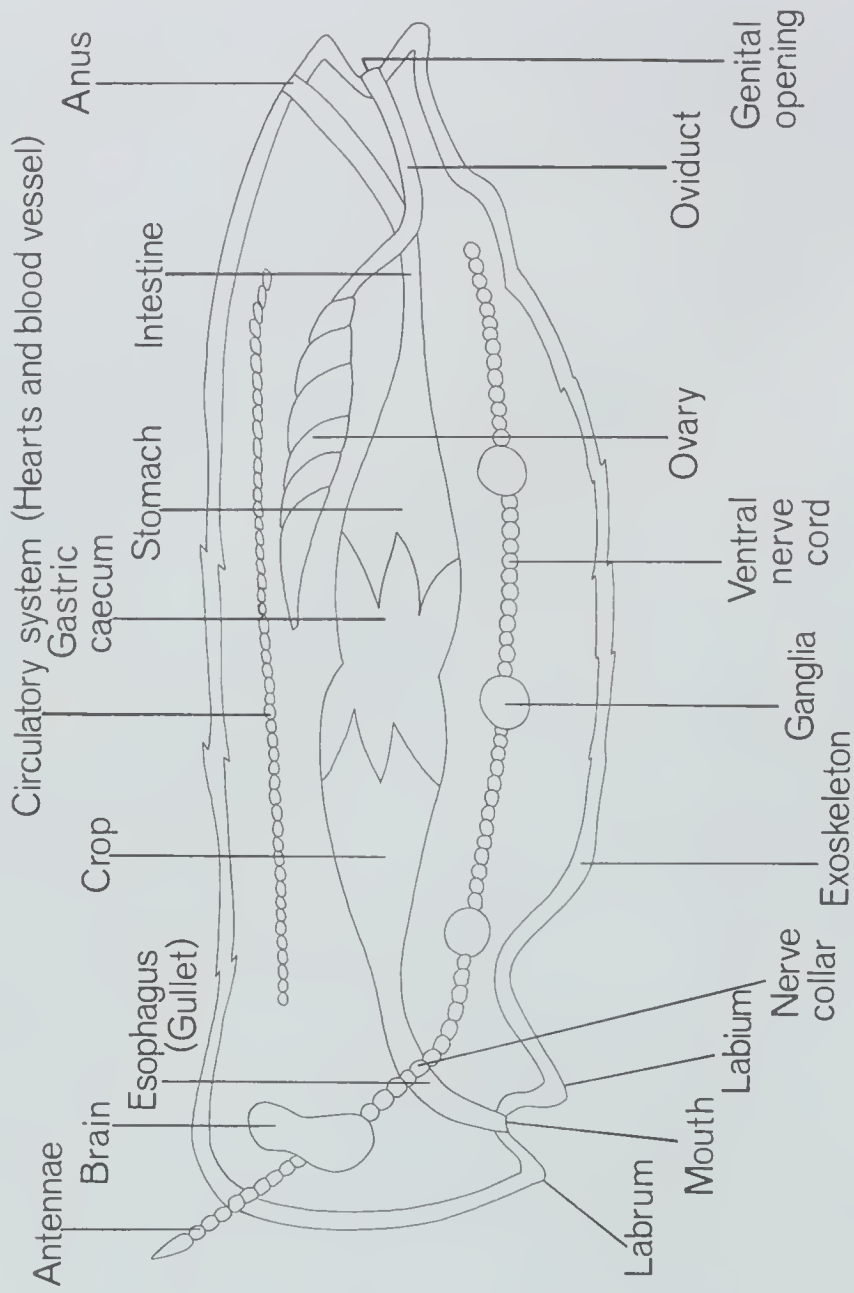
ASCON SPONGE (Internal structure)



EARTHWORM (Cross section)







GRASSHOPPER (Internal structure)

HYDRA (Internal structure)

Tentacles

Mouth

Gastro vascular cavity
(Food cavity)

Ectoderm

Endoderm

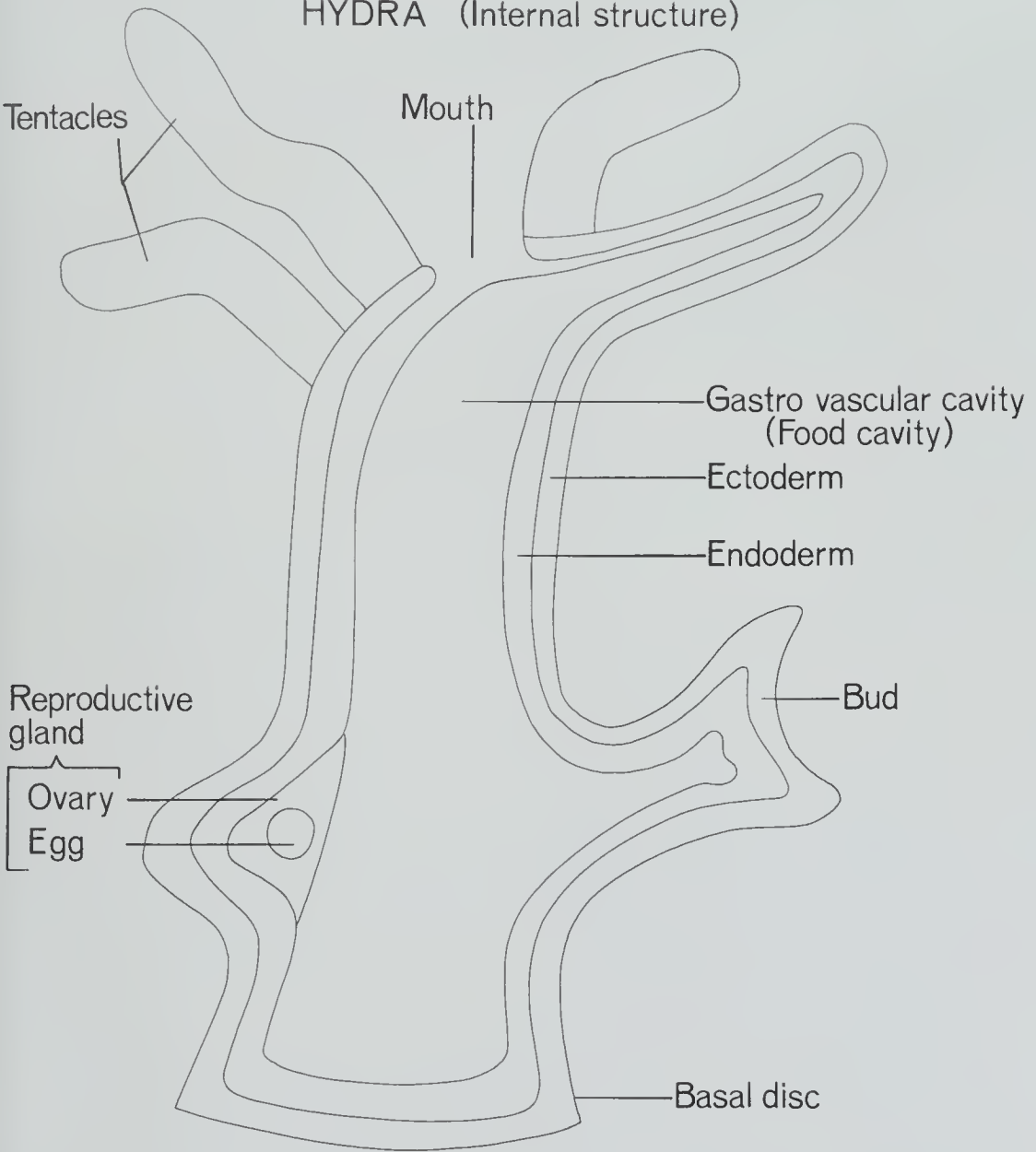
Reproductive
gland

Ovary

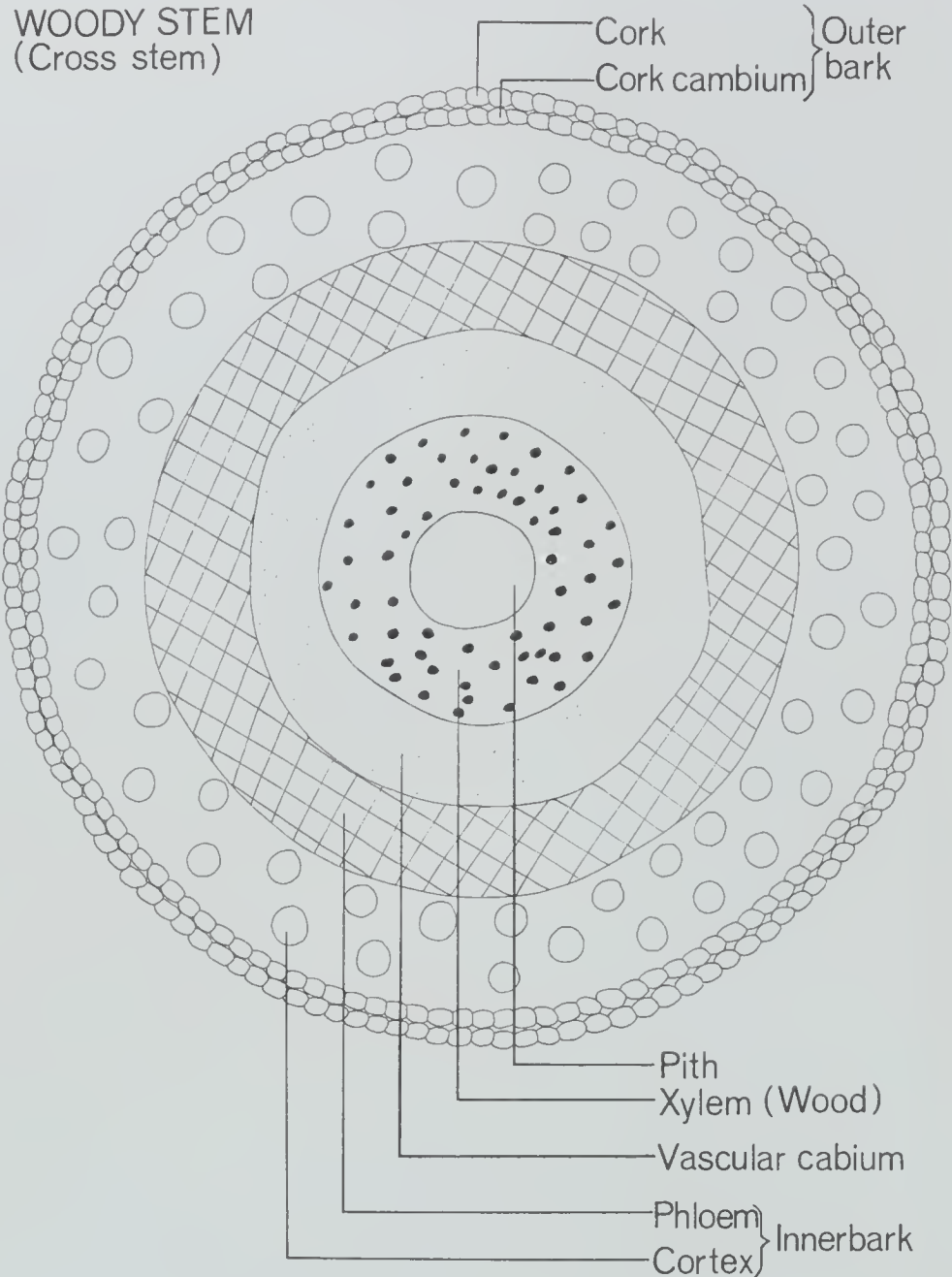
Egg

Bud

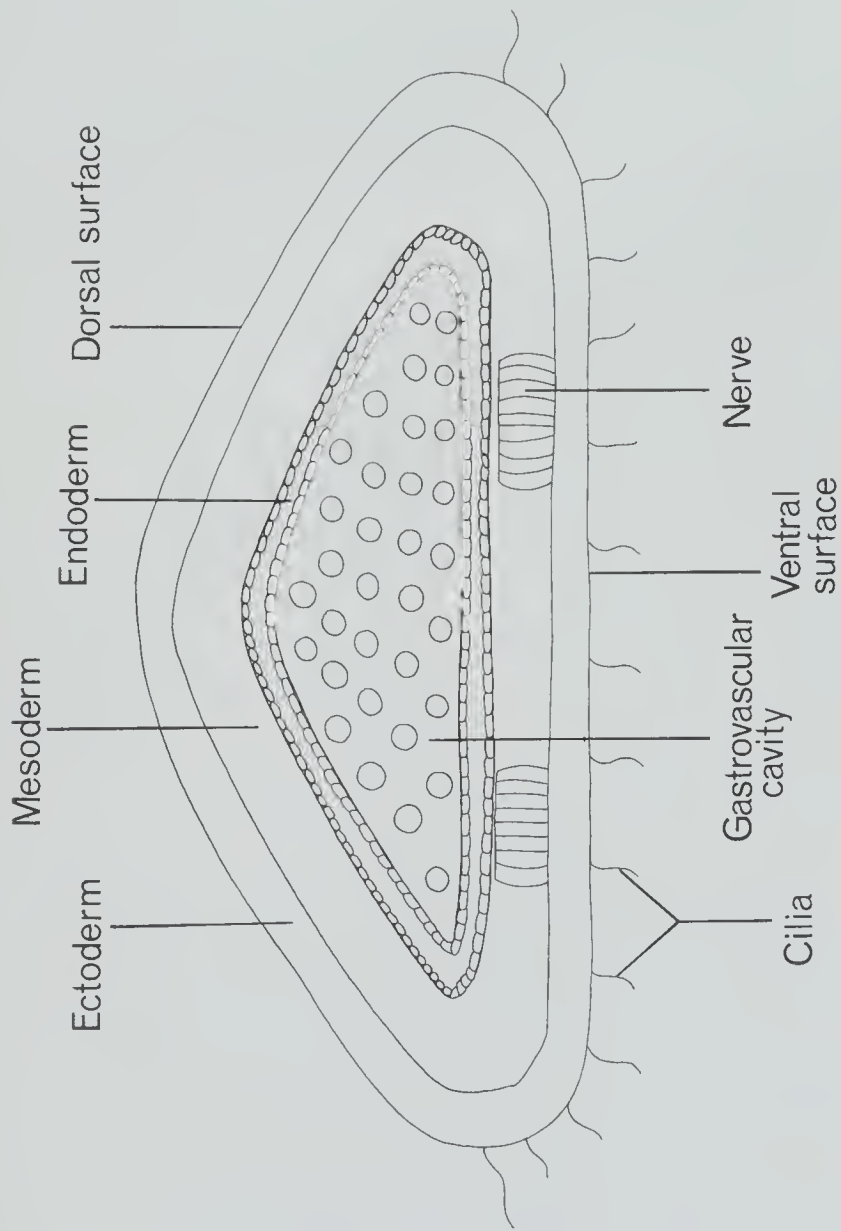
Basal disc

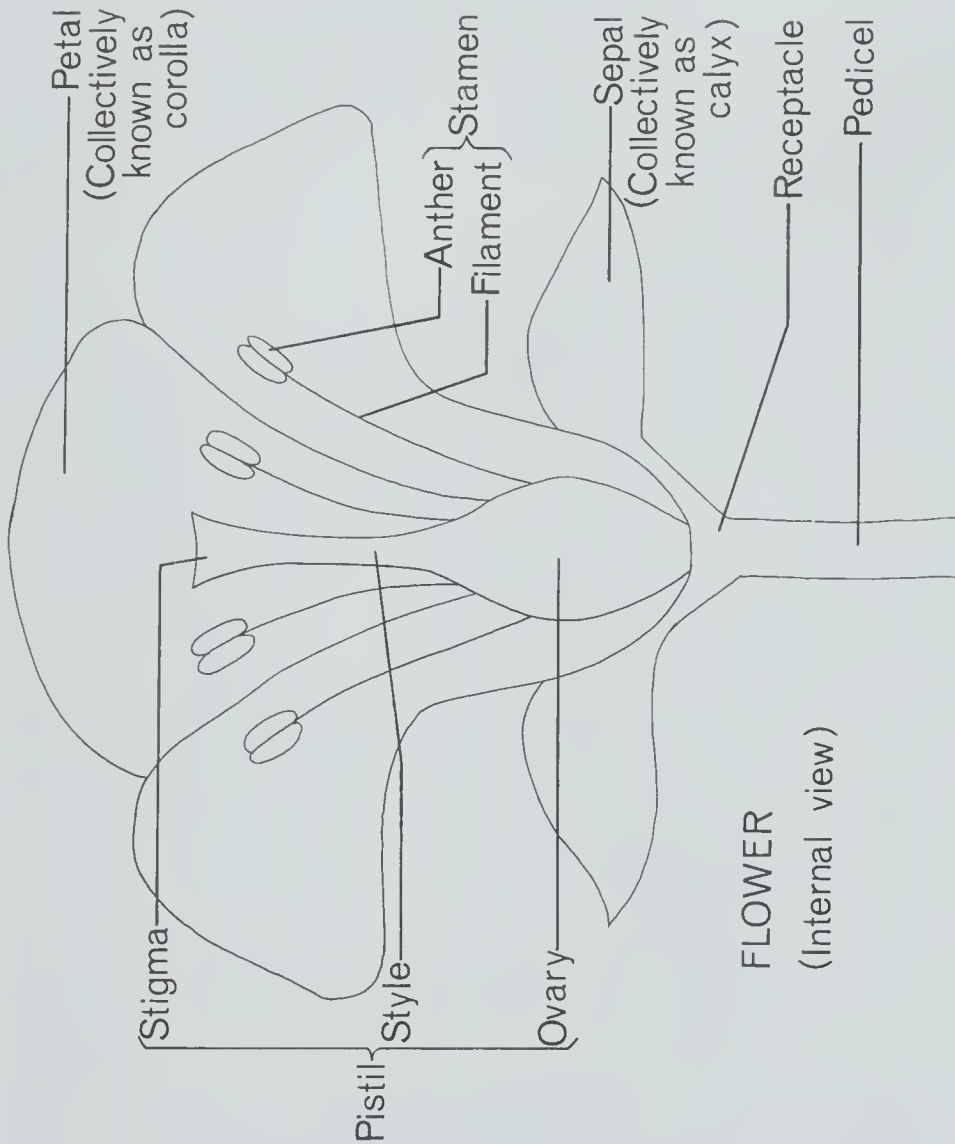


WOODY STEM
(Cross stem)

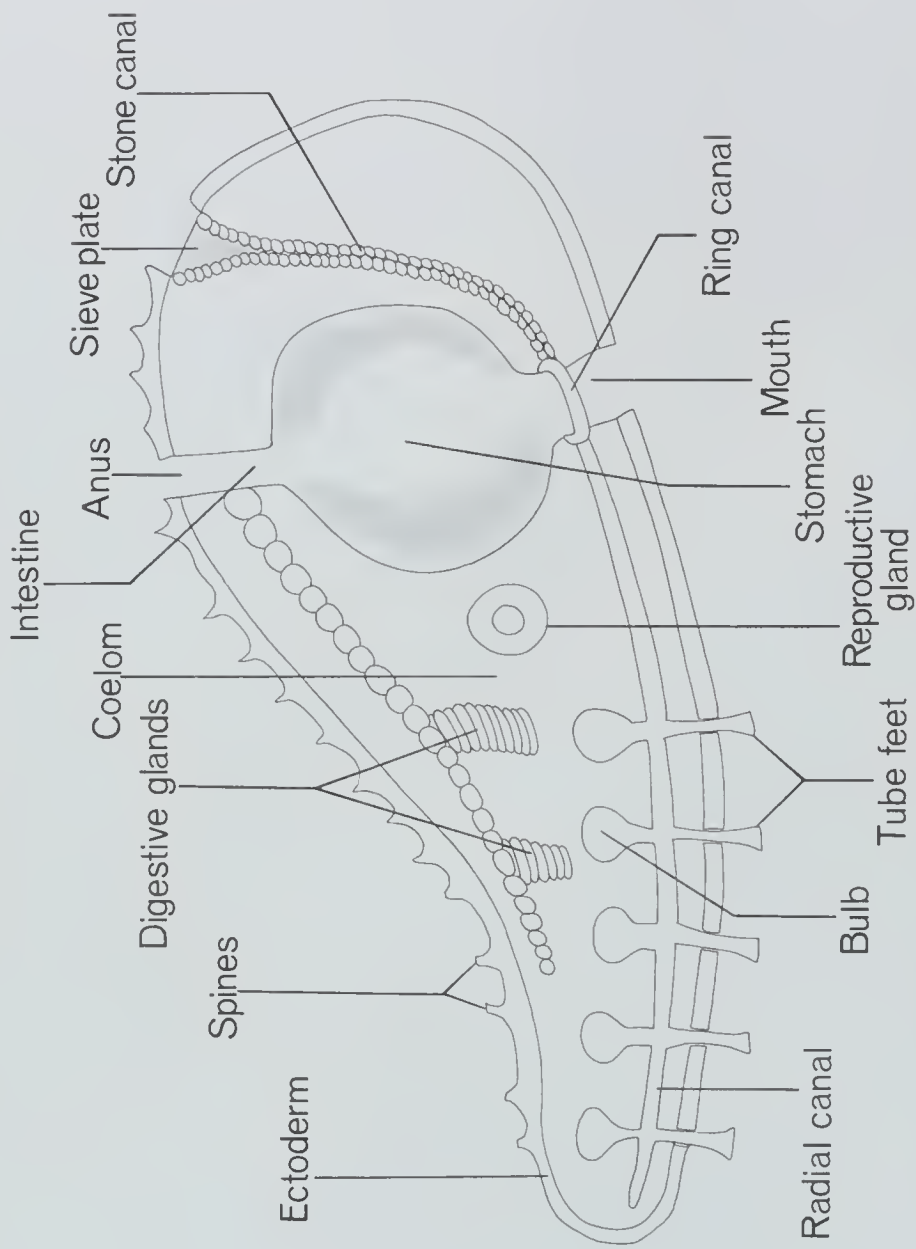


PLANARIA (Cross section)



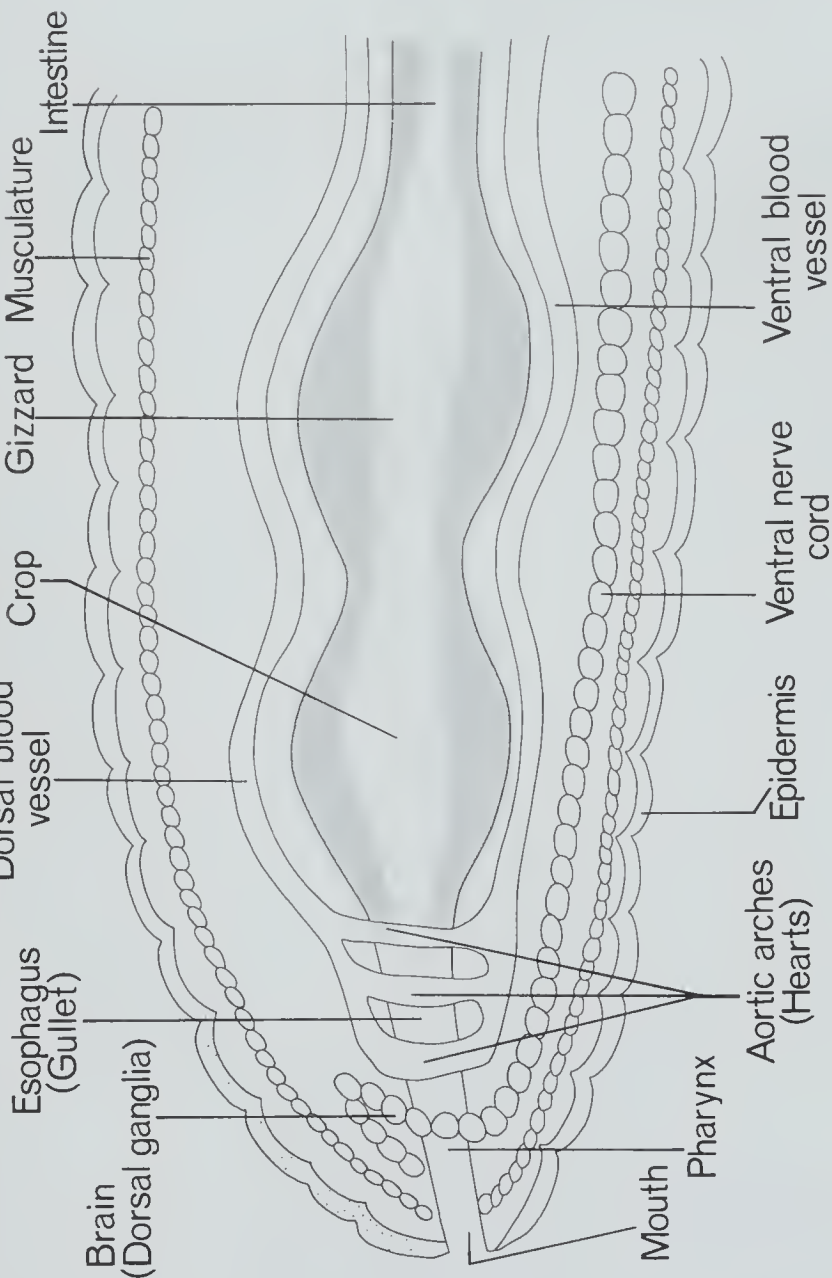


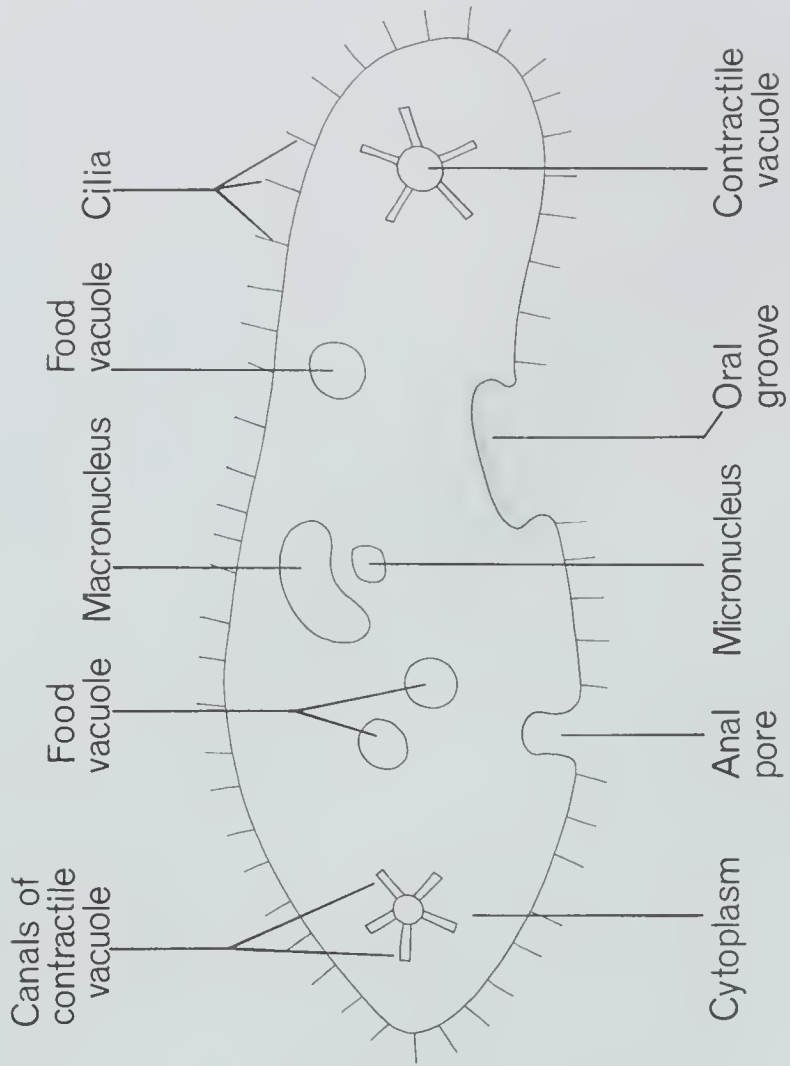
STARFISH (Internal structure)



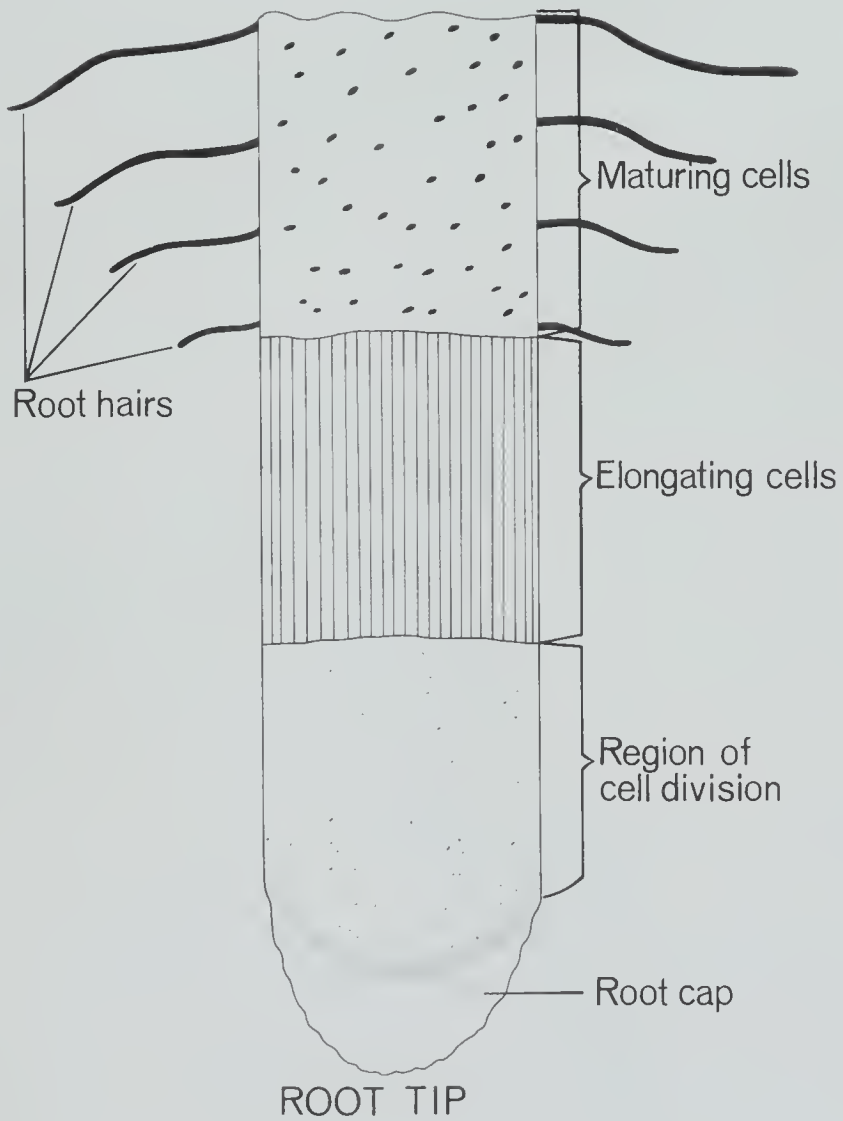
EARTHWORM

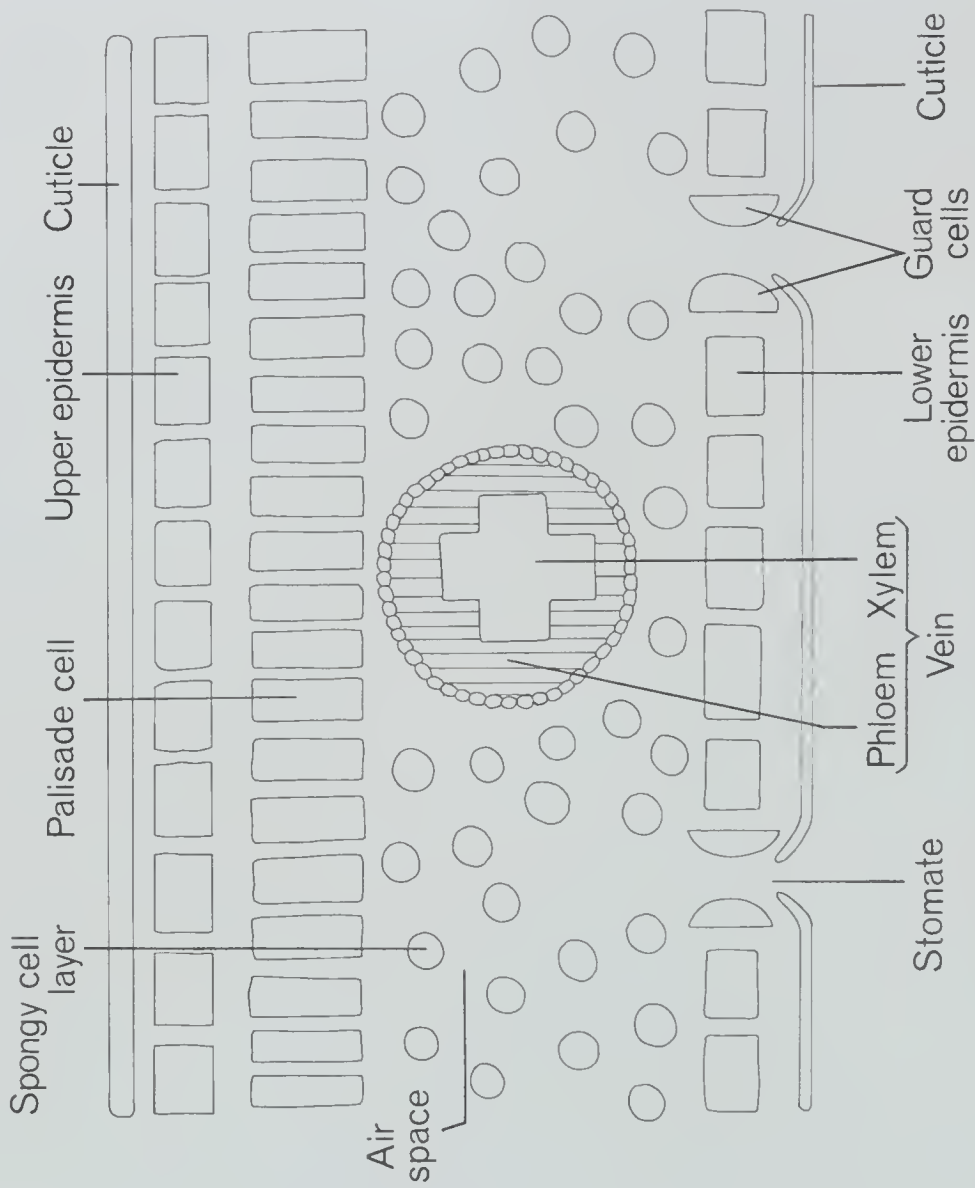
(Nervous and circulating system)



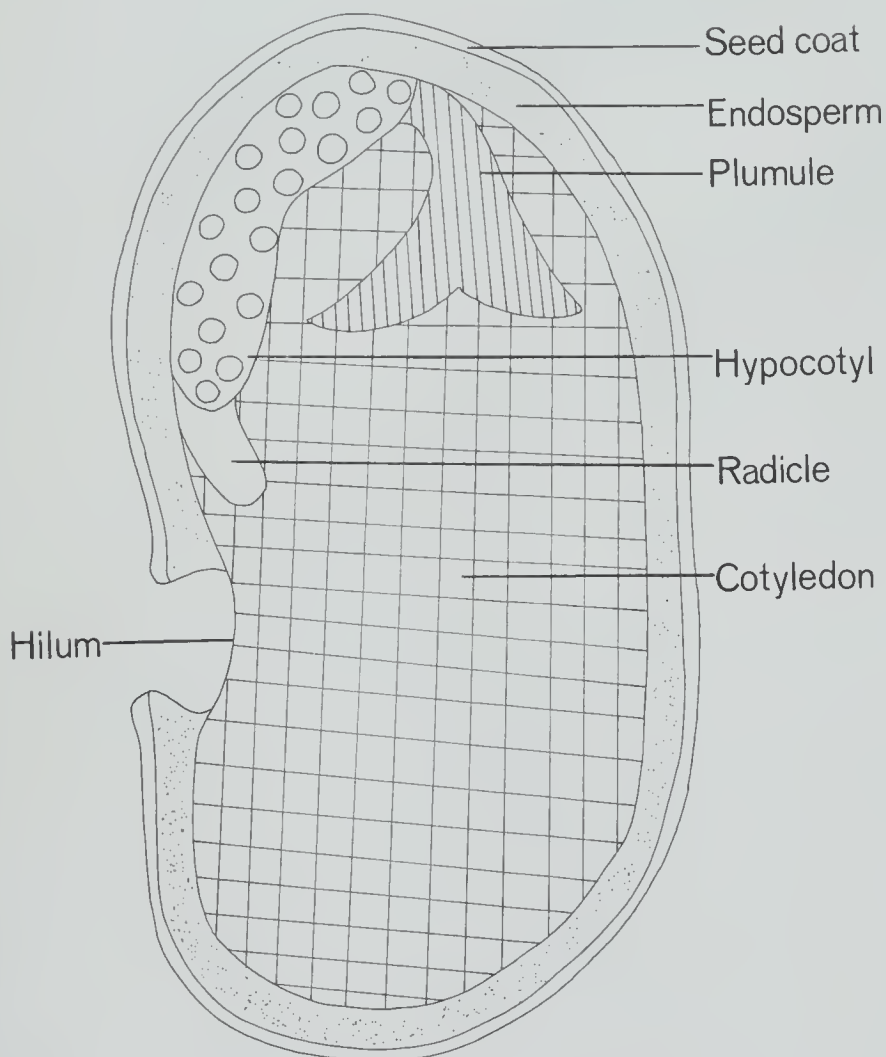


PARAMECIUM (Internal structure)

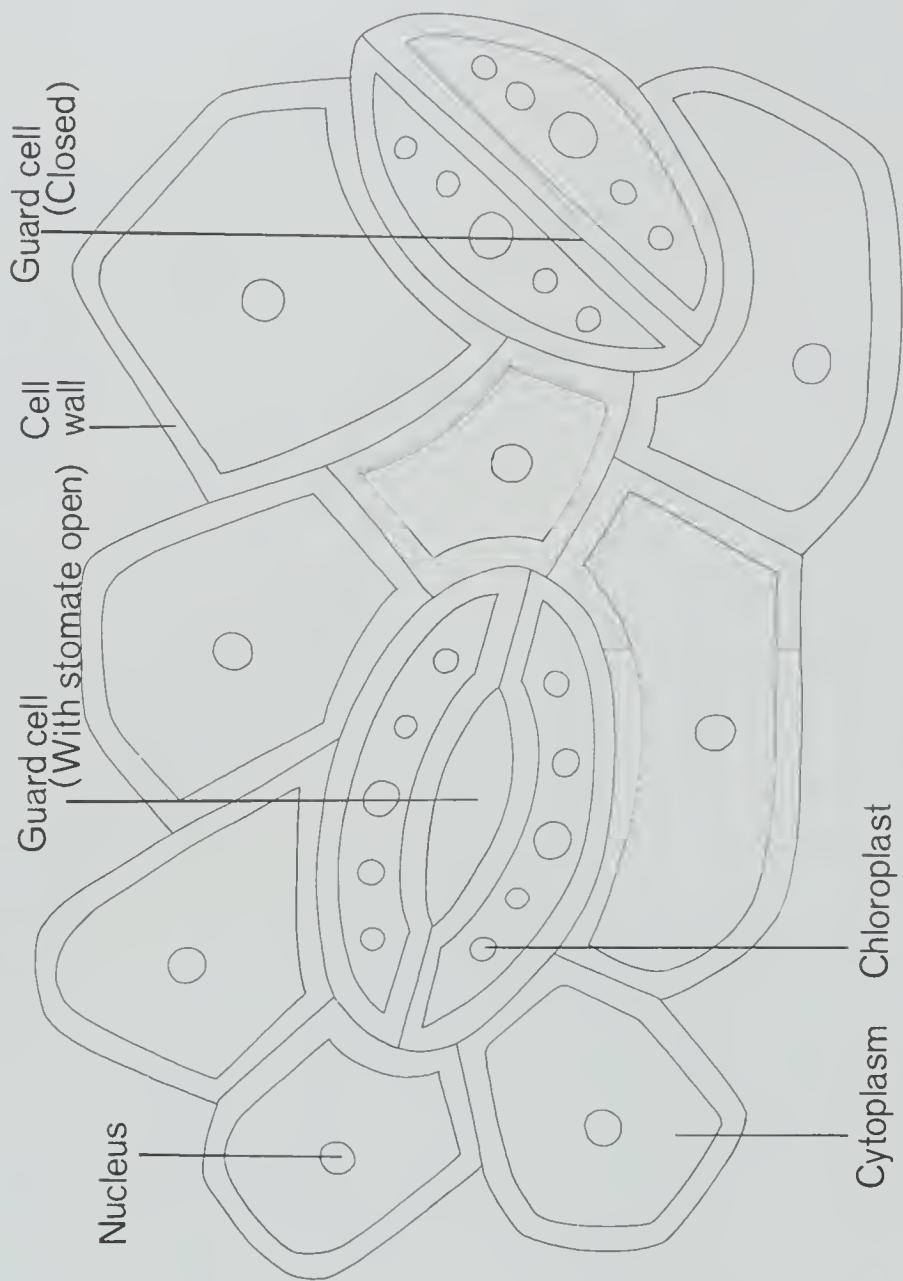




LEAF (Cross section)



BEAN SEED (Internal structure)



LEAF (Lower epidermis)

Bold-Line Writing Paper

(including special paper for beginners in manuscript
and cursive writing)



Notebook Paper

Manufactured by

American Printing House for the Blind

1839 Frankfort Avenue

P. O. Box 6085

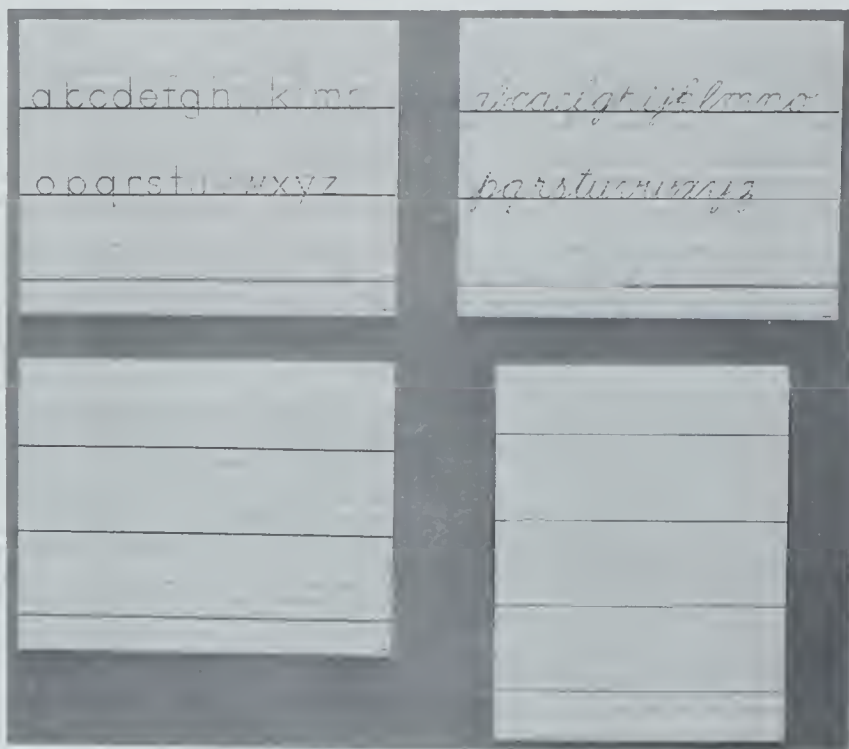
Louisville, Kentucky 40206

BOLD-LINE WRITING PAPERS

Four types of bold-line writing paper are now available, i.e., for primary or beginning students of writing, for grade school pupils, for notebook use, and for letter writing.

Beginners' Writing Paper — This paper is printed with black ink on white, 50-pound, standard finish paper, $8\frac{1}{2}$ " x 11" in size, with the lines running either the short or long way of the paper. On the paper with the lines running the short way of the paper, the lines are printed in four sets of four lines each. On the paper with the lines running the long way, there are three sets of lines of four lines each. The lines of each set are $\frac{1}{2}$ " apart, and are arranged with two lightface lines above and one lightface line below the heavy bold line, which indicates the base line for writing. The lightface line immediately above the base line sets the limit for the height of the body of lower case letters. The top lightface line and the lightface line below the base line set the limits for the ascenders and descenders of certain letters. The heavy base line and the top lightface line set the limits for all capital letters. Each package contains one sample sheet each of manuscript and cursive letters.

Separate packets of both the manuscript and cursive letter sheets are also available. A 1-pound package of each of the four papers contains approximately 100 sheets.



Notebook Paper

Lines $\frac{7}{16}$ " Apart:

Padded. Cat. No. 1-0479.

Punched. Cat. No. 1-0485.

Lines $\frac{9}{16}$ " Apart:

Padded. Cat. No. 1-0480.

Punched. Cat. No. 1-0486.

Letter-writing Paper (padded only)

Lines $\frac{7}{16}$ " Apart. Cat. No. 1-0481.

Lines $\frac{9}{16}$ " Apart. Cat. No. 1-0482.

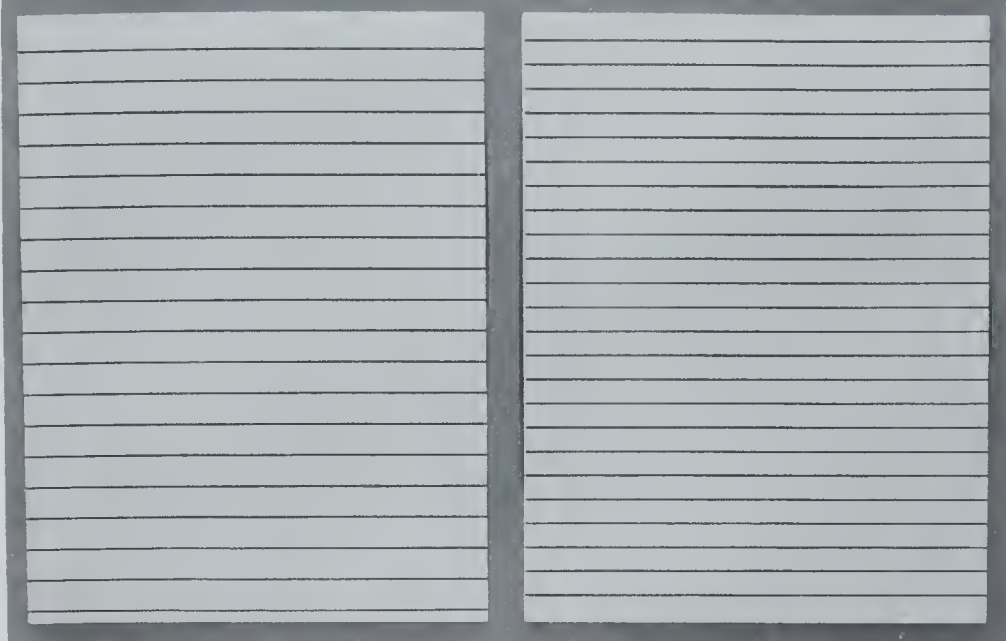
Green-lined Paper for Grade School Pupils — This paper is the same as that supplied for many years, with wide, bold lines in green ink, $\frac{3}{4}$ " apart, on $8\frac{1}{2}$ " x 11", India-colored, 70-pound antique-finish paper. Two types are available, with the lines running either the short or the long way of the paper. There are approximately 60 sheets to a 1-pound packet of paper. Either type may be purchased in pads (unpunched) or unpadded but punched to fit a 3-ring notebook.



Green-lined Writing Paper

Notebook Paper — This paper has bold black lines printed on white, 50-pound, standard finish paper, $8\frac{1}{2}$ " x 11" in size. The lines are printed the short way only, either $\frac{7}{16}$ " or $\frac{9}{16}$ " apart, with vertical margin lines added at the left. Either type may be purchased in pads (unpunched), or unpadded but punched to fit a 3-ring notebook. There are approximately 100 sheets to a pound of paper. (See picture on front.)

Letter-writing Paper — This paper has bold black lines printed on white, 50-pound, standard finish paper, $8\frac{1}{2}$ " x 11" in size, with the lines printed the short way only, either $\frac{7}{16}$ " or $\frac{9}{16}$ " apart. There are approximately 100 sheets to a pound of paper, which may be purchased in padded form only, unpunched.



Letter-writing Paper

Catalog Numbers:

(**Note:** All papers are printed on both sides of the sheet, except for those marked with an (*) asterisk.)

Beginners' Writing Paper

Writing Paper:

Lines running long way of paper, padded. **Cat. No. 1-0474.**

Lines running short way of paper, padded. **Cat. No. 1-0473.**

***Writing Paper with Over-printing of Cursive Letters** (lines running long way of paper only; padded). **Cat. No. 1-0477.**

***Writing Paper with Over-printing of Manuscript Letters** (lines running long way of paper only; padded).
Cat. No. 1-0478.

For Grade School Pupils

Lines Running Short Way of Paper:

Padded. Cat. No. 1-0483.

Punched. Cat. No. 1-0487.

Lines Running Long Way of Paper:

Padded. Cat. No. 1-0484.

Punched. Cat. No. 1-0488.

BRAILLE CODE RECOGNITION (BCR) MATERIALS AND INSTRUCTIONAL KIT



Manufactured by

American Printing House for the Blind

1839 Frankfort Avenue

P. O. Box 6085

Louisville, Kentucky 40206

BRAILLE CODE RECOGNITION (BCR) MATERIALS AND INSTRUCTIONAL KIT

The Braille Code Recognition (BCR) Materials and the Instructional Kit for Teachers constitute two separate instructional packages. The BCR materials contained are:

- a. One — 42 page Braille booklet “BCR lists No. 1 — 20”
- b. One — 24 page Braille booklet “BCR Exercises”
- c. Five — print sets, “BCR lists No. 1 — 20”
- d. One — print copy “Directions for Braille Code Recognition Lists”
- e. One — print copy “Percentage Accurate Conversion Table”
- f. One — 24 page print booklet “BCR Exercises”
- g. Five — Sheets Braille Progress Charts (Raised line graphing materials)

The contents will adequately meet the instructional needs of five Braille reading students.

The contents of the Instructional Kit for Teachers is:

- a. One — 30 minute instructional cassette
- b. Five — packet A's
- c. Five — packet B's
- d. Ten — sets of Handouts (No. 1-6)
- e. One — Leader's Guide
- f. Ten — Evaluation Forms

Materials contained in the instructional package are adequate to train up to ten teachers in the use of the BCR materials.

Studies by Henderson (1967) and Umsted (1970) have demonstrated that training Braille character recognition can lead

to increased speed and accuracy in reading. The BCR materials are based on this research and provide systematic training to increase speed and accuracy in recognition of Braille contractions, word signs, and short form words. The materials provide opportunities for individualized tutoring under conditions that will challenge and encourage students. It is recommended that the BCR materials be used only with students who already have attained a basic understanding of the Braille code.

The BCR materials and/or the Instructional Kit must be ordered separately.

(Caution) The Braille booklets are re-useable, but since the task is quite unique and is highly dependent upon fine tactual discriminations care should be taken to insure that the quality of the dots in the Braille cells be closely monitored. For best results it is recommended that no more than five students use any one Braille booklet either lists or exercises.

References

Henderson, F. The effect of character recognition training on Braille reading. Unpublished specialist in education thesis, George Peabody College for Teachers, 1967.

Umsted, R. G. Improvement of Braille reading through code recognition training. Unpublished doctoral dissertation, George Peabody College for Teachers, 1970.

Catalog Numbers:

Braille Code Recognition Materials Kit — 1-0324 ^{\$25.00}
Braille Code Recognition Teacher's Kit — 1-0325 ^{\$3.25}

CHANG MOBILITY KIT



Manufactured by
American Printing House for the Blind
1839 Frankfort Avenue
P. O. Box 6085
Louisville, Kentucky 40206

CHANG MOBILITY KIT

The Chang Mobility Kit is a light, portable unit, consisting of 47 flat geometric forms of 13 different shapes and sizes, plus a baseboard, all lined with interlocking Velcro so that the various pieces can be held in place. The entire set is enclosed in a black fiberboard carrying case 12" x 24" x 1½", with an overall weight of approximately 8 pounds. Designed first as a tactical aid for instructors of orientation and mobility, the various forms can be arranged to simulate basic representations of street layouts, including right-angle, multiple and "T" intersections; angular, circular and medial-strip island crossings; dead ends; and cul-de-sacs.

The contents of the kit consist of:

- 1 hinged baseboard, 18" x 24" unfolded size, or inverse folded 18" x 12", with the face lined with "Pile" Velcro to which the pieces can be temporarily attached.
- 47 flat geometric forms made of fiberboard to which "Hook" Velcro has been glued on the back so that they will attach to the baseboard.

These pieces consist of:

- 2 8" x 11" rectangles
- 4 8" x 4½" rectangles
- 12 4½" x 3½" rectangles
- 1 16" x 4½" rectangle.
- 4 3½" x 4½" rectangles with corner scooped out
- 2 ¾" x 8" strips
- 4 ½" x 3½" strips
- 1 11" x 5" x 7½" x 8" x 5" polygon
- 4 isosceles right triangles with an 8½" base
- 1 isosceles right triangle with a base of 3¾"
- 4 (2 perpendicular left and 2 perpendicular right)
general right triangles (90°, 30°, 60° angles)
7½" x 8½" x 4½"
- 4 (2 perpendicular left and 2 perpendicular right)
general right triangles (90°, 30°, 60° angles)
3½" x 4½" x 5½"

- 1 cul-de-sac 8" x 11"
- 1 cul-de-sac 4½" x 8"
- 1 circle 3" diameter
- 1 circle 1½" diameter
- 1 strip "Hook" Velcro ¾" x 12"

While the Chang Mobility Kit has been designed first as a tactual aid for mobility instruction, any creative teacher can use the kit in a variety of ways, thus:

- a. The forms can be fitted together and arranged to represent most physical structures in any environment.
- b. Furniture arrangements in a room can be shown.
- c. Spatial relationships and cardinal directions can be taught.
- d. Number grouping and graphs may be represented.
- e. Shapes and sizes may be introduced.
- f. Buildings, corridors, the locations of doors and windows can be mapped.
- g. School grounds, parking lots and shopping centers may be displayed.
- h. Whole city sections may be shown.

Teachers may make additional shapes to fit local needs, using the extra strip of "Hook" Velcro which is included in the set. Pieces of this Velcro can be adhered to such teacher-constructed shapes and forms with epoxy glue. Additional pieces of the "Hook" Velcro are available from most fabric centers.

For three-dimensional objects, ingenuity can create such ideas as glued on wooden pegs for fire plugs, tiny toy cars for traffic, miniature light standards, sandpaper to denote different surfaces, etc.

Chang Mobility Kit (sold in complete sets only). **Cat. No. 1-0313.**

DOLCH WORD CARDS

LARGE TYPE AND BRAILLE EDITION



Manufactured by
American Printing House for the Blind
1839 Frankfort Avenue
P. O. Box 6085
Louisville, Kentucky 40206

DOLCH WORD CARDS LARGE TYPE AND BRAILLE EDITION

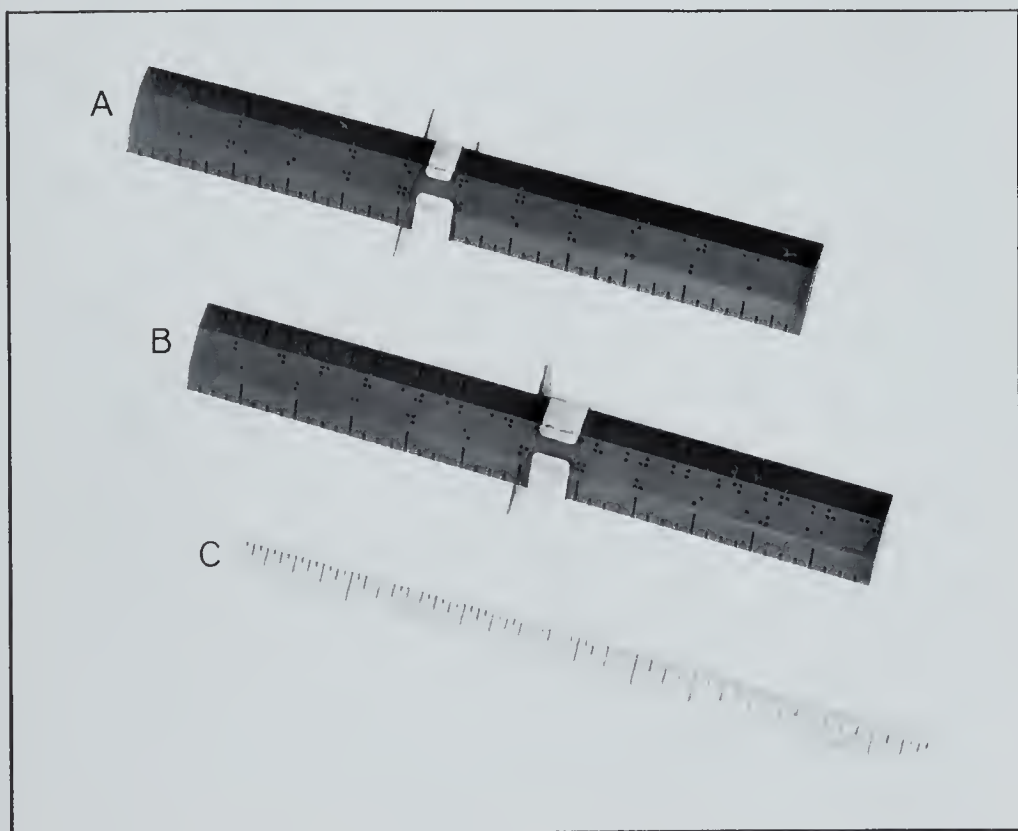
The Dolch Word Cards, Large Type and Braille Edition, were produced by the American Printing House for the Blind with the permission of the publisher, Garrard Publishing Company, Champaign, Illinois. The complete set combines the Dolch Popper Words Set I and Set II. Words in these sets consist of the Dolch 220 Basic Sight Words which make up 75 percent of the primer words, 65 percent of first and second readers and 50 percent of all other school books. They include the most commonly used pronouns, adjectives, adverbs, prepositions, conjunctions, and common verbs which must be recognized by sight before a child can read with interest and confidence. The cards may be used in conjunction with first and second grade readers or they may be used independently for drill and review.

Cards in the Dolch Word Cards, Large Type and Braille Edition are 3½" x 2" with the upper right hand corner cut to indicate the correct position of the card. Each card contains both large type and Braille words. Large type words are in 18-point type and Braille words are in grade two Braille. The cards are made of standard Braille paper and the set of 220 cards are packaged in a small cardboard container to facilitate handling and storage.

Catalog Number—1-0356

ENGLISH AND METRIC-ENGLISH 1-FOOT BRAILLE RULERS WITH CALIPER SLIDES

APH GLUE-DOWN RULE



A. English-Measurement Ruler

B. Metric-English Ruler

C. APH Glue-down Rule

Manufactured by

American Printing House for the Blind

1839 Frankfort Avenue

P. O. Box 6085

Louisville, Kentucky 40206

ENGLISH-MEASUREMENT 1-FOOT BRAILLE RULER

(See A, front page)

This device consists of a regulation 1-foot ruler, to which has been added a caliper slide for determination of measurements. The ruler is made of moulded black plastic, and is 12" long x $1\frac{1}{2}$ " x $\frac{1}{4}$ " thick in the center, tapering down to $\frac{1}{16}$ " thick at the reading edges. Raised lines lead back from the reading edges, indicating fourths, halves and inches on one edge, and eighths, fourths, halves and inches on the other. Braille figures are located at the inch divisions.

The steel caliper slide is designed to aid in measuring from one surface to another, as well as to set the ruler for a series of identical measurements. It is tension-set to hold it in place as needed, but can be readily moved backward and forward along the rule. The guide extends $\frac{3}{8}$ " outward from the rule, with a raised lip which runs to a point. This makes it possible to take measurements, set the guide, and then remove the ruler from the material being measured for easy reading with the figures.

For measurements to $\frac{1}{8}$ ", the edge of the slide is adequate; however, an auxiliary pointer is provided on the upper scale which permits reading up to $\frac{1}{16}$ ". This is accomplished by reading the dimension to the last line uncovered by the slide; then, if the auxiliary pointer lines up with a line, $\frac{1}{16}$ " is added.

The ruler and the slide are sold as a single unit only, although the caliper slide can be purchased separately for use with rulers previously purchased and not equipped with slides.

Catalog Numbers:

English-measurements Ruler with Caliper Slide.

Cat. No. 1-0307.

Caliper Slide (replacement part). Cat. No. 1-0306.

After applying the epoxy to the desired surface, place the rule over the epoxy and press down firmly, so as to push the excess glue from under the rule. Cleaning around the edge of the rule should be done with a small amount of alcohol on a cloth while the plastic is still tacky. After checking the rule for position and cleanliness, a heavy weight should be placed over the entire rule and should remain in place until the epoxy has completely hardened. Any sharp protrusions of epoxy left after the glue has hardened should be smoothed off with sandpaper. If it is necessary to clean the surface of the rule, use a fine steel wool; however, be careful not to catch the edge of the rule and rip it off.

APH Glue-down Rule. Cat. No. I-0308.

Credit for the original design of the glue-down rule should be given to the 1963 Shop Teachers' Workshop, held at New York University College, Oswego, New York, directed by Dr. James R. Hastings.

METRIC-ENGLISH 1-FOOT BRAILLE RULER

(See B, front page)

This device consists of a regulation 1-foot ruler, to which a caliper slide has been attached. Similar to the English-measurements ruler, it is moulded of black plastic, and is 12" long x $1\frac{1}{2}$ " wide and $\frac{1}{4}$ " thick in the center, tapering down to $\frac{1}{16}$ " at the reading edges. Raised lines leading back from the reading edges are located at the inch and quarter-inch intervals along the bottom edge, and 1-centimeter and $\frac{1}{2}$ -centimeter (5 millimeters) intervals on the top scale. Braille numbers indicating the 1-inch intervals (bottom edge) and 2-centimeter intervals (top edge) are read from the left-hand edge.

The steel caliper slide is similar to the one of the English rule and is designed to aid in measuring from one surface to another or for indicating a given measurement.

This ruler is especially useful in teaching the relationship between the metric and English systems of measurement.

Replacement slides can be obtained when needed.

Catalog Numbers:

Metric-English Ruler with Caliper Slide. Cat. No. 1-0310.

Caliper Slide (replacement part). Cat. No. 1-0309.

APH GLUE-DOWN RULE

(See C, front page)

The APH glue-down rule is made of a thin strip of brass, $\frac{1}{2}$ -inch wide, .010 inches thick, and 12 inches in length. Its main virtue as a measuring device is its versatility. By use of epoxy plastic, it can be attached to almost anything almost any-

where. This rule can be used on such things as sewing machines, band saws, foot shears, cutting boards, drawing boards, rules, curved surfaces, etc. By placing a number of rules end to end, they can be made into yardsticks, six-foot rules, etc.

Raised lines indicate the divisions of the rule. The inch lines run all the way cross the width of the rule, the other proportionately smaller divisions down to $\frac{1}{8}$ " inch on one side only. Rapid measurements can be made in the following manner: If the rule is glued down to a surface with the reading edge with all the divisions facing right, the forefinger can quickly slide down the left edge showing the inch marks only, then move over to the right for the finer measurements when the desired inch-line has been reached.

The rule comes taped to a rigid board and should remain so attached until it is to be glued to a desired surface. The brass of which the rule is made is very pliable and can easily be bent out of shape, thus creating problems with adhesion. Epoxy glue, which can be obtained from almost any hardware store, is recommended as the adhesive to bond the rule to almost all surfaces.

Surface preparation is a very important step in adhering the rule to any object. A small, very rough piece of sandpaper is supplied with each rule and should be used to score both the back of the rule and the surface to which it is to be glued.

- a. If the rule is to be bonded to a metal surface, approximately five strokes in one direction should be sufficient to prepare the surface. Do not polish the surface by repeatedly sanding in one spot, but press hard enough so that the sandpaper will dig into the metal.
- b. Plastic surfaces should be treated in the same manner, depending on the hardness of the plastic. On soft plastics, a couple of strokes will be enough.
- c. Woods, depending on the finish, require less sanding. Woods with no finish need no sanding. Hard wood with a lacquer or varnish finish can be prepared with approximately three hard strokes.

Braille Reading-Readiness Materials

FORMBOARD WITH REMOVABLE "HANDS"

TOUCH AND TELL

A Reading-readiness Book Compiled Especially
for Blind Children



Formboard with Removable "Hands"

Manufactured by

American Printing House for the Blind

1839 Frankfort Avenue

P. O. Box 6085

Louisville, Kentucky 40206

For a number of years, the Printing House has offered the three-volume publication **TOUCH AND TELL** by Betty (Duncan) Womack, which includes a pamphlet of mimeographed instructions. This book is designed as a reading-readiness book for use prior to teaching Braille reading to beginning blind children. As the first illustration in **TOUCH AND TELL**, there are embossed dot pictures of left and right hands of about the size of those of a 6-year-old child. As a further pre-reading aid, a wooden formboard with removable wooden "hands" has also been developed. These materials are described below.

FORMBOARD WITH REMOVABLE "HANDS"

The formboard consists of a wooden base painted gray, 7" x 16" x $\frac{3}{8}$ " in size, incised with a left and right hand, each 5" across x $3\frac{9}{16}$ " high, into which are fitted two wooden blocks, painted blue, in the same shape and size of left and right hands. The top of the "hands" are smooth, but the bottoms are textured, so a child can tell which is top and which is bottom. When the hands are in place, they extend $\frac{1}{4}$ " above the base surface.

Suggested Uses (for parent, teacher, brother, sister, etc.):

1. Show the board with hands to the child in the way which makes most sense to him. At first, he need know only that this device is a kind of puzzle, with two pieces to be taken out and put in. Help him learn that each piece *fits* in only one of the two spaces. (For this purpose, the child should be taught that the textured side of both hands must always be on the bottom.)

2. If the child can observe visually, talk about color with him, as well as visual shape. The child with *little or no* vision will probably need more time to realize that these pieces are like hands; if he notices on his own, good! If he does not notice this resemblance after several contacts with the pieces, point out to him their likenesses to hands. i.e., the five parts representative of fingers, etc. Then, through putting his hands on top of the pieces, he can begin to see the similarities.

3. When the child is able to recognize that the two pieces are *like hands*, but are *not hands*, talk over together how they are *different from*, as well as *like*, real hands, i.e., feeling, function, composition, color, size (compared to his), odor, number of fingers, warmth (body), and so on.

4. First awareness of left and right may begin through the child's learning these concepts in terms of his own hands and of the "puzzle" hands. Later, this understanding can be extended to other body parts, and then to objects.

5. When used as a pre-aid for TOUCH AND TELL, the embossed-dot representations of left and right hands on the first two pages of Volume I can be a second step in developing beginning understanding with regard to pictures. Care should be taken to point out the similarities in size and shape of the Braille-dot hands to the puzzle hands, and that both have certain main characteristics of real hands.

6. Interspersed with the above activities, be sure that the child has time for free play with this puzzle:

a. Encourage his playing with other children, using the puzzle; encourage his creative use of the puzzle; be creative yourself in your use of it with him. Remember that *all* children can enjoy this material, whether or not they are visually impaired.

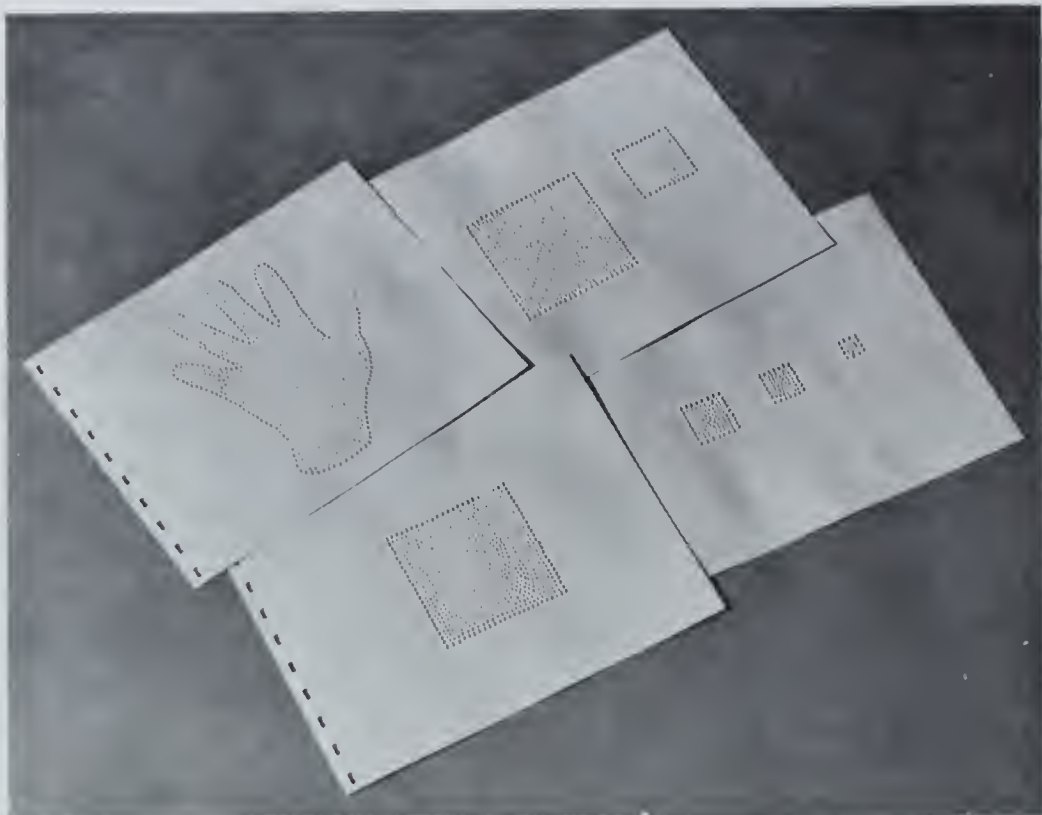
b. Help the child to expand his vocabulary as you work with him in the various activities. Talk to him in simple, meaningful, broadening terms, and encourage him to use these terms. Through the use of meaningful vocabulary, the child learns to think and to do.

c. **Remember:** The child who has *little or no vision* must "look with his fingers". The child who seems to have any useful vision at all, however, should be prompted to use it and shown how to do so. Holding things close to his eyes indicates visual interest and awareness on the child's part, and he should be encouraged to use whatever vision he has.

Catalog Number 1-0370.

TOUCH AND TELL

A Reading-readiness Book Compiled Especially for Blind Children



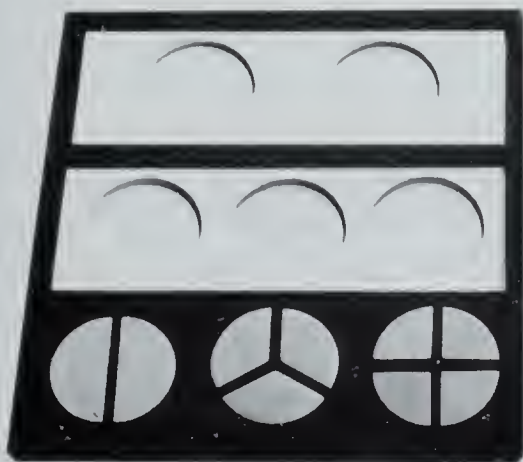
This set of materials consists of three small volumes, $9\frac{1}{2}$ " wide x $7\frac{1}{2}$ " high, plus a small mimeographed pamphlet of instructions. The first two pages of Volume I show embossed left and right hands of the same size and shape of the wooden hands in the formboard. Volumes I and II then go on to show embossed geometric figures, starting with large ones and working down to smaller ones, and varying combinations of figures on the same page. Volume III introduces the child to Braille dots, singly and in combination, and to the ideas of reading across lines from left to right.

The purpose of the book is to stimulate thinking and discussion, and to help the child consciously realize that a means to this end is his sense of touch. The book is divided into three parts for:

1. Ease in handling.
2. Minimizing the time necessary for completion of a whole part, which will give more children the chance for early, happy success.
3. Making possible the replacement of individual volumes when they become soiled or worn.

Catalog Number 6-4467. (3 v; 47 pp).

FRACTIONAL PARTS OF WHOLES



Fractional Parts in Storage Area

Work Tray Containing Nests



Manufactured by
American Printing House for the Blind
1839 Frankfort Avenue
P. O. Box 6085
Louisville, Kentucky 40206

FRACTIONAL PARTS OF WHOLES

The Fractional Parts of Wholes Aid was designed as a tactile analog to parallel educational materials available to sighted students. The kit consists of a wooden work tray, three plastic form boards containing one, two, and three empty nests respectively, one whole circle cut into halves, one circle cut into thirds, and one circle cut into fourths. A whole circle is three inches in diameter and nine-sixteenths of an inch thick. The whole and its fractional parts are designed to nest in form boards. Each fractional part in the kit rises three-eighths of an inch above the form board nests for tactile inspection. The form board nests and parts are housed in the work tray. The uniqueness of the kit for the blind lies in the combination of the work tray, form board nests for the parts, and parts which rise above the form board nests.

An instructional program is included with the kit to provide the teacher with a set of exercises to introduce the aid to young visually handicapped students.

Catalog No.—1-0329.

GEOMETRIC AREA AND VOLUME AID (GAVA)



Manufactured by

American Printing House for the Blind

1839 Frankfort Avenue

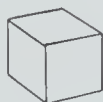
P. O. Box 6085

Louisville, Kentucky 40206

GEOMETRIC AREA AND VOLUME AID

The GAVA set of geometric blocks for finding volume and surface area was developed by the Instructional Materials Reference Center of the American Printing House for the Blind. The set consists of 30 unpainted, wooden blocks (10 different shapes), 20 connector pegs, and a wooden storage/carrying tray. With these blocks it is possible to construct models of three-dimensional figures relating to surface area and volume which are most often found in elementary mathematics texts.

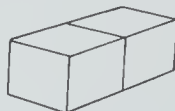
The unit size of each block is 1 cubic inch. The set consists of the wooden tray divided into 11 sections, 6 single-unit blocks plus 24 multiple-unit blocks, and 20 connector-pegs. The multiple-unit blocks are made tactile by incised grooves which provide for easy unit discrimination. Each of the different blocks is assigned a code-letter identifier (see below), and is stored in the proper section of the wooden tray which carries the corresponding letter (see cover page).



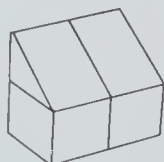
A



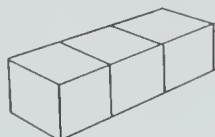
B



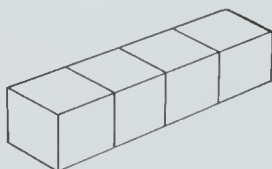
C



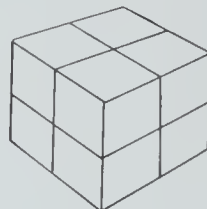
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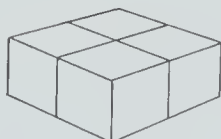
E



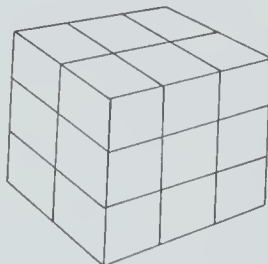
F



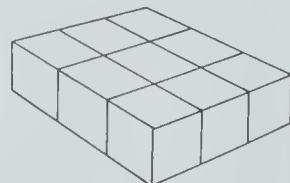
G



H

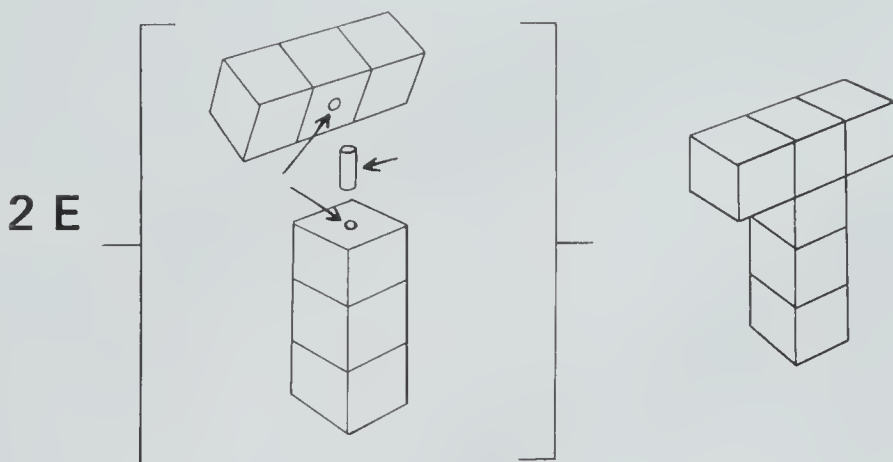


J



K

Code-letter identifiers make it possible to construct various figures according to construction formulas. *Example:*



This folder, in addition to illustrations of the blocks and their code-letter identifiers, also gives construction formulas for 36 commonly used figures and some suggested activities for students. Construction of the figures is accomplished by inserting the connector pegs into holes in the blocks to hold them together. The student determines *volume* by counting the number of cubes in each solid and *surface area* by counting the number of sides he can touch on each form. The set was field-tested to prove its effectiveness when used by visually handicapped children.

Contents of Set

The set consists of the following items, stored in a tray 24" x 8" x 3½" — total weight 5½ pounds.

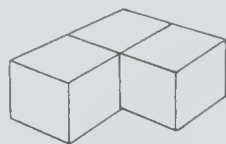
30 wooden (maple) blocks of 10 shapes, code-letter identified as follows:

6 blocks — A	2 blocks — F
2 blocks — B	2 blocks — G
2 blocks — C	3 blocks — H
4 blocks — D	2 blocks — J
3 blocks — E	4 blocks — K

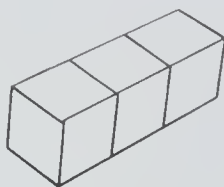
20 connector-pegs

GAVA (sold in complete sets only). **Cat. No. 1-0320.**

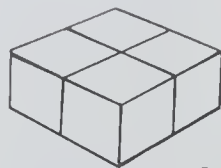
Some Suggested Assembly Formulas



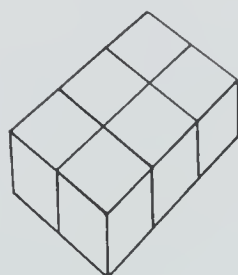
1 A + 1 C



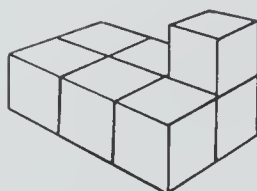
1 E



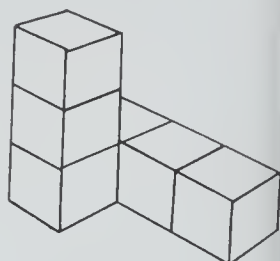
1 H



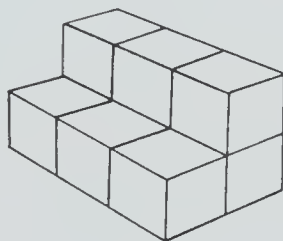
2 E



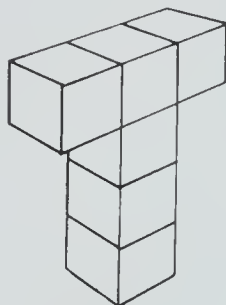
1 A + 2 E



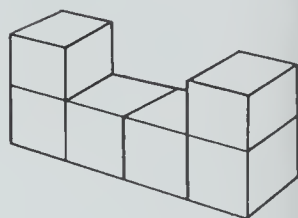
2 E



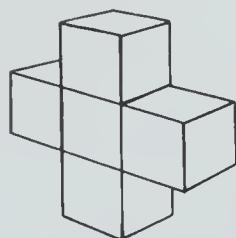
3 E



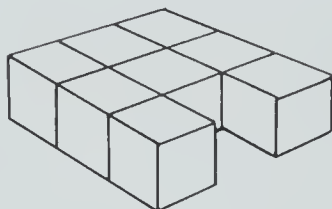
2 E



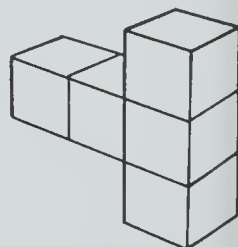
1 F + 2 A



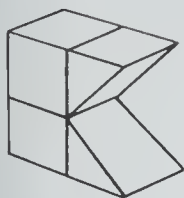
1 E + 2 A



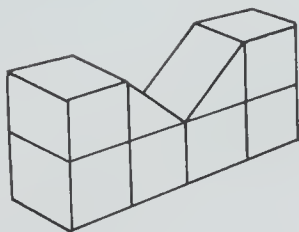
2 A + 2 E



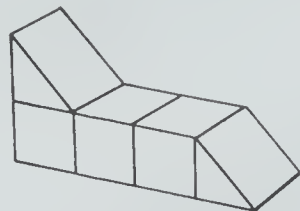
1 C + 1 F



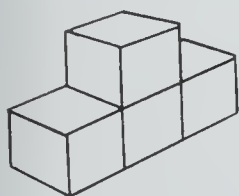
2 B



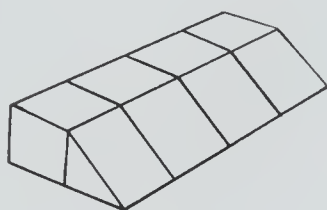
2 B + 1 F



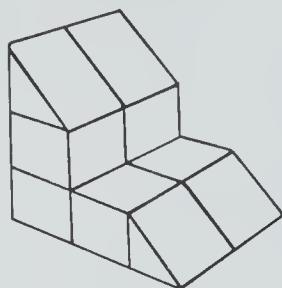
1 A + 2 B



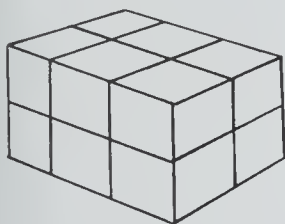
1 E + 1 A



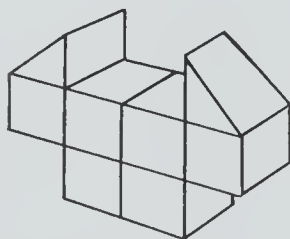
2 D



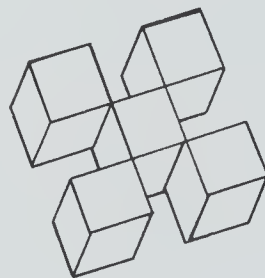
1 C + 2 D



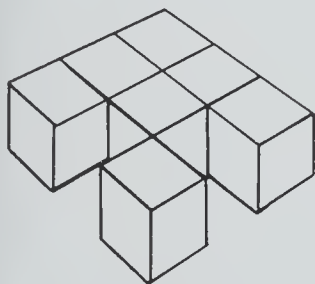
1 G + 1 H



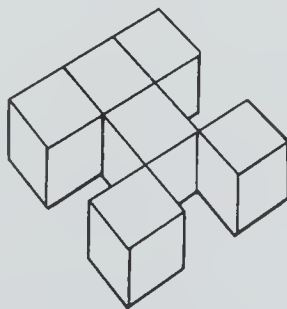
2 B + 1 G



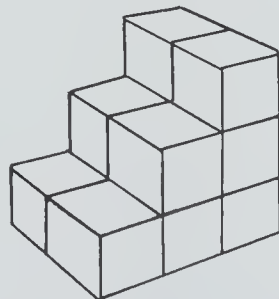
5 A



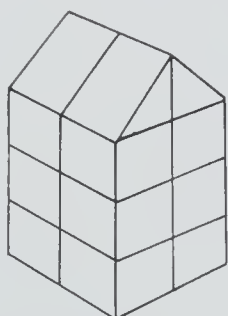
2 A + 1 C + 1 E



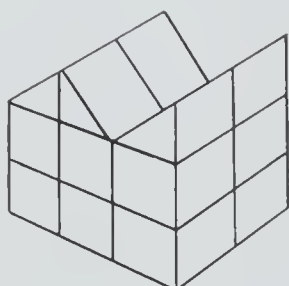
1 E + 3 A



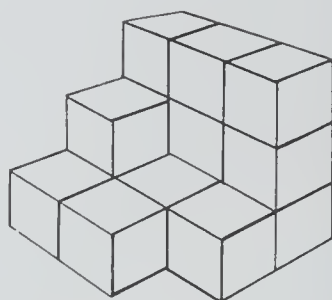
2 H + 2 C



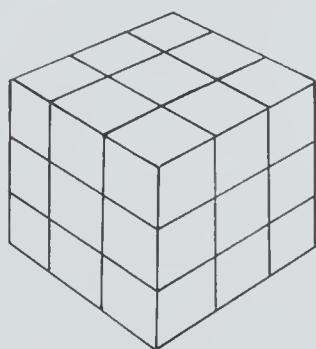
$$4 C + 2 D$$



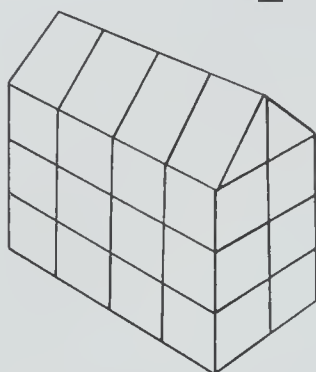
$$1 H + 1 C + 3 D$$



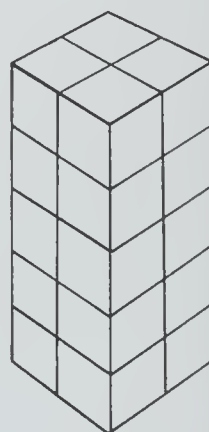
$$2 C + 2 E + 1 A + 1$$



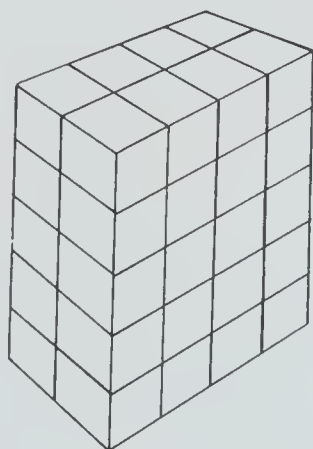
$$1 J + 1 K$$



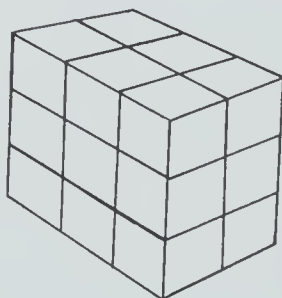
$$2 G + 4 D$$



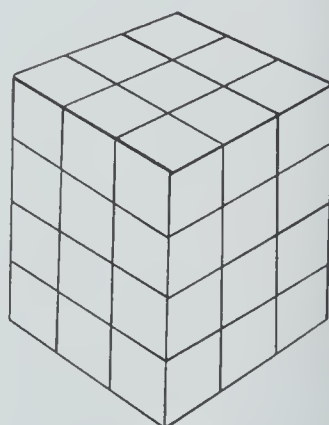
$$1 H + 2 G$$



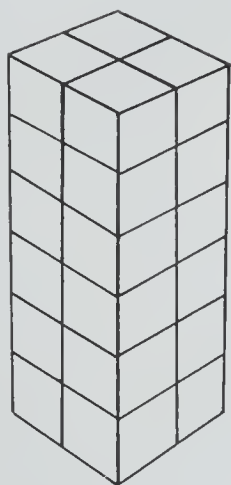
$$1 J + 2 G + 2 E$$



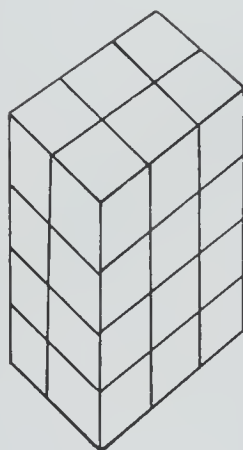
$$1 J$$



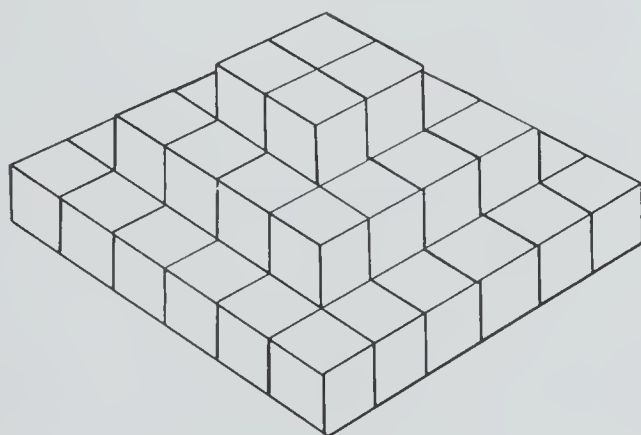
$$2 J$$



$$2 G + 2 H$$



$$1 J + 2 E$$



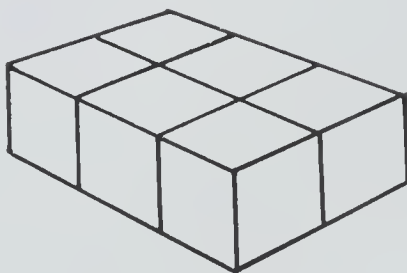
$$2 F + 2 C + 1 G + 4 K$$

Some Suggested Activities

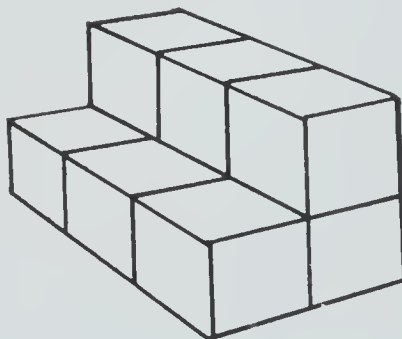
Volume

You can find the volume of each figure by counting the number of cubes it contains. We call each cube a "cube unit." You will give your answers in "cube units," not in inches. You must give only the number of cubes in each figure. You must always remember to count the cubes you cannot touch when the figure is sitting on the table. *Examples:*

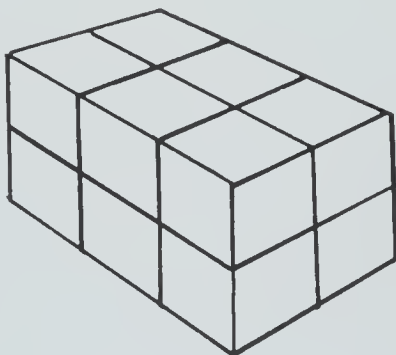
1. The volume of this figure is 6 units.



2. The volume of this figure is 9 units.



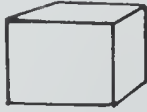
3. The volume of this figure is 12 units.



Surface Area

You can find the surface area of each figure by counting the number of sides it has. We call each surface square a unit of surface area. You will give your answers in surface squares, not in inches. You must always remember to count the surface squares you cannot touch when the figure is sitting on the table. *Examples:*

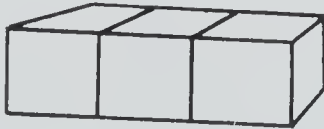
1. You can touch 5 sides of this cube when it sits on the table. When you hold the cube in your hand, how many sides can you touch? You can touch 6 sides in this figure; therefore the surface area is 6 units.



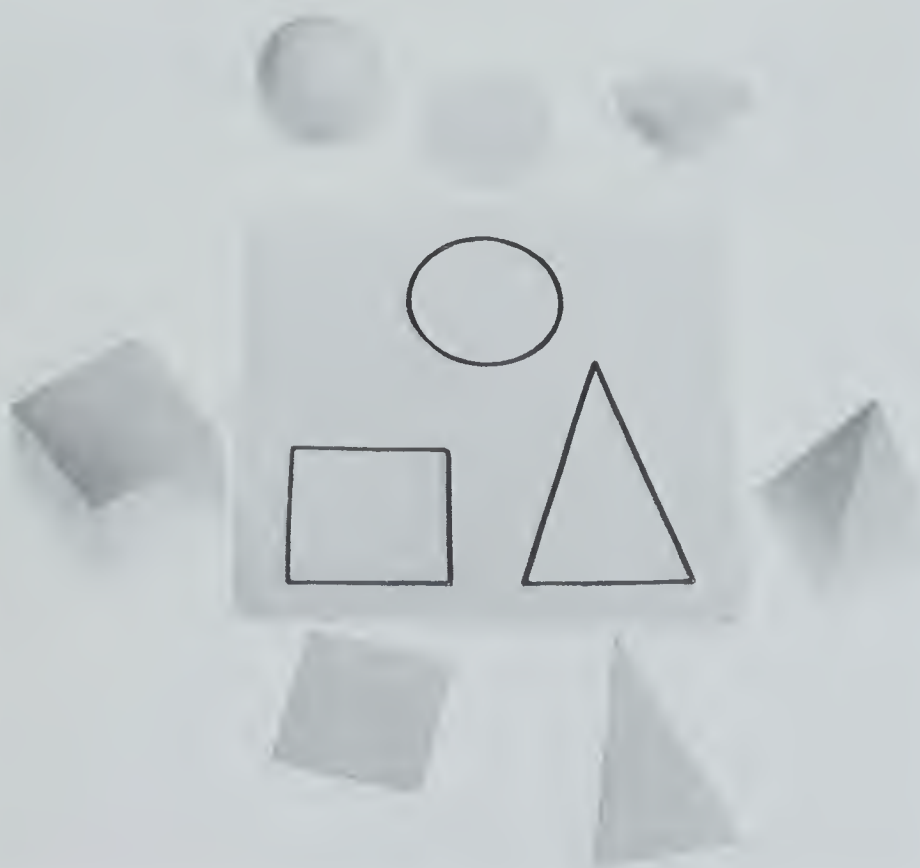
2. When two cubes are connected together to make a figure like this, how many sides can you touch? Remember to count only the sides you can touch. You can touch 10 sides in this figure; therefore, the surface area is 10 units.



3. When three cubes are connected together to make a figure like this, how many sides can you touch? The answer is fourteen; therefore, the surface area is 14 units.



GEOMETRIC FORMS



Manufactured by

American Printing House for the Blind

1839 Frankfort Avenue

P. O. Box 6085

Louisville, Kentucky 40206

GEOMETRIC FORMS

The Geometric Forms aid was designed to introduce to primary level visually handicapped students the shapes of a circle, square, and triangle which are represented in the primary mathematics curriculum as curves, plane figures, and three dimensional solids. These materials will allow the very young student to sequentially conceptualize the diagrammatic illustrations found in print and braille texts by investigating the relationship between a special closed curve (outline figure), a plane figure, and a three-dimensional solid.

This aid consists of one white vaccum formed plastic sheet illustrating 3 special closed curves - - circle, square, triangle - - which are colored black to maximize contrast; 3 plane figures and 4 solids.

SUGGESTED ACTIVITIES FOR USE WITH GEOMETRIC FORMS

The following exercises form a program of information which is sequentially developed to familiarize the student with the relationship between curves, plane figures, and three dimensional solids. The task confronting the young visually handicapped student in examining this primary level material is to conceptualize the abstract. This aid is specifically designed to enhance concept attainment by allowing the young handicapped student to tangibly examine that information which is illustrated in print texts.

SPECIAL CLOSED CURVES

Concepts

1. A curve is a line (set of points) which forms a path.
2. Some curves form special shapes.
3. Curves which have no openings are called closed curves.
4. The circle, square, and triangle are examples of special closed curves.
5. A circle is round and has no corners.
6. A square has four sides of equal length and four corners.
7. A triangle has three sides and three corners.

Operations

1. Examine the vaccum formed sheet. Assist the student in systematically scanning the sheet.
2. Locate and trace each figure on the sheet.
3. Identify each figure as a special closed curve. Explain that these are closed curves because they have no openings.
4. Identify the shape of each special closed curve as the shape of a square, a triangle, and a circle.
5. Define the characteristics of each special closed curve.

- a. Square - four sides of equal length and four corners
- b. Triangle - three sides and three corners
- c. Circle - round like a coin having no corners
6. Trace each side of the square, count the sides, and note the equal lengths.
7. Identify a corner as where two sides meet and locate the four corners of the square.
8. Trace and count each side of the triangle.
9. Identify a corner as where two sides meet and locate the three corners of the triangle.
10. Trace the circle and note that this special closed curve has no corners.

PLANE FIGURES

Concepts

1. A plane is a flat surface that goes on and on in all directions.
2. Planes can form special shapes such as a square, a triangle, and a circle.
3. Planes and special closed curves can form the same shapes of circle, square, and triangle.

Operations

1. Examine the plane figures of circle, square, and triangle. Note the color of each plane figure.
2. Explain that the figures are called planes and that these planes form the special shapes of circle, square, and triangle.
3. Discuss various examples of planes; identify likenesses and the differences between the plane figures and the special closed curves.
 - a. Plane figures possess surface area.
 - b. Special closed curves are lines (set of points) which form shapes.
 - c. Special closed curves and plane figures can form the same shapes.
4. Compare the shapes of the planes with the shapes of the special closed curves.
 - a. Trace the shapes of the special closed curves on the plastic sheet.
 - b. Examine the shapes of planes.
 - c. Place each plane inside its identical special closed curve and trace the shapes touching both the outline of the curve and the side of the plane.
 - d. Identify the characteristics of each shape.

THREE DIMENSIONAL SOLIDS - SPECIAL CLOSED SURFACES

Concepts

1. Three dimensional solids have special shapes.
2. A three dimensional solid may have surfaces shaped like a square or triangle or may be round like a circle.
3. A cube is a three dimensional solid which has six surfaces shaped like a square.

4. A pyramid is a three dimensional solid which has four surfaces shaped like a triangle. The bottom of the pyramid is shaped like a square.
5. A sphere is a three dimensional solid which is round like a ball and has no corners.

Operations

1. Examine the three dimensional solids of sphere, cube, and pyramid. Note the colors of each solid.
2. Explain that the solids are called sphere, cube, and pyramid and that each has a special shape.
3. Examine the cube. Identify the solid as having six surfaces shaped like a square.
4. Note that each surface of the cube is the same size.
5. Place the plane shaped like a square against a surface of the cube. Note the identical shape and size.
6. Count how many surfaces the cube has by placing the square plane against each surface.
7. Examine the pyramid. Identify the solid as having four surfaces shaped like a triangle. Note the bottom of the pyramid is shaped like a square.
8. Place the plane shaped like a triangle against one of the triangular surfaces of the pyramid. Note the identical shape and size.
9. Count how many triangular surfaces the pyramid has by placing the triangle plane against each triangular surface. Note the bottom is shaped like a square.
10. Examine the Sphere. Identify the solid as having no corners.
11. Explain that the shape of the sphere is round like a ball.
12. Compare the shape of the circular plane and the sphere.
 - a. The circular plane is a balloon and becomes a sphere when filled with air.
 - b. The circular plane is a slice from the center of a lemon, which is shaped like a sphere.

Catalog Number 1-0341 \$6.75

INDIVIDUAL STUDY SCREEN



Manufactured by

American Printing House for the Blind

1839 Frankfort Avenue

P. O. Box 6085

Louisville, Kentucky 40206

INDIVIDUAL STUDY SCREEN

The Individual Study Screen provides 7X magnification and close viewing for the low visioned child who cannot profit from group viewing of film strips and other materials when projected on a large screen and viewed at a distance.

DESCRIPTION

The outside measurement of the aluminum frame is 11 1/2" x 14 1/2" x 3/8". By means of a threaded metal rod and butterfly nuts, a 3/4" square wooden leg, six inches in length, is attached to each lower corner of the frame. Each frame has packed with it a package of 25 sheets (11" x 14") of Deitzen Professional Layout and Sketch Paper. This paper inserted in the frame becomes a screen for receiving the image from either side, rear or front. Four pressure insert strips hold the screen in place.

To insert or replace paper screen, remove the pressure insert strips (use a stylus, etc. in the hole drilled at the lower left to pry out the first strip) — arrange the paper on the frame and replace pressure insert strips by pressing them into the grooves of the frame.

The overall weight of the frame and screen is only 10 oz.

SUGGESTIONS FOR USE

The Individual Study Screen (ISS) can be used in a lighted room without bleaching color or line in the projected image. This means that note-taking, copy work, etc. is possible while having a clear, vivid image for viewing in any position needed for the individual user.

With the legs folded in a closed position (along side the frame) the students can hold or move the ISS to any angle that suits them. With the legs extended at an angle from the screen it becomes a self-supported front or rear projection screen.

The ISS should be on a flat surface which is high enough for the user to view all areas of the screen while maintaining

an acceptable posture. For example, if the flat surface is too low the user has to bend over and cannot focus well on the lower half of the screen; if the flat surface is too high or the chair too low then the upper half of the screen is troublesome. It is possible for the viewer to adjust the angle of the screen as he looks from the top half to the lower half. This is done simply by tilting the screen forward or backward and makes it possible to maintain the focal distance needed. The washers used with the rod and nut generally make possible this slight adjustment back and forth without tightening the butterfly nuts.

If the ISS is set up so that the user views it from the front (as television is viewed) magnification of seven times can be achieved by placing the projector approximately 4 feet behind the ISS. This magnification is equivalent to that of 28 diopters. This form of rear-view projection makes it possible for the viewer to move as close as needed and/or to use additional aids such as hand magnifiers for more critical visual examination. A remote control cord is needed when the viewer works in this position. A smaller image is obtained if the projector is moved closer to the screen. The 7X is based on the ratio of size of slides to size of the ISS and the four feet is the approximate distance required to focus clearly an image which fills the screen.

When rear view projection is being used, slides, filmstrips, etc. must be fed into the projecting equipment reversed from the normal position. If material being viewed has no right or left, it can be viewed successfully from both sides of the screen at the same time. For example, a low visioned child requiring magnification and close viewing can be positioned as explained above. At the same time a group of viewers with normal vision can see at four feet or more the images projected on the other side of the screen. They can also view at closer than four feet by sitting to either side of the projecting equipment.

Catalog Number - 1-0330

American Printing House for the Blind

P. O. Box 6085

Louisville, Kentucky 40206

GIANT TEXTURED BEADS

This set of materials consists of 12 large wooden beads of three different shapes — 4 cubes, 4 rectangular solids, and 4 cylinders. Each shape is painted its own distinctive color (red for the cube, yellow for the rectangular solid, and light blue for the cylinder). Three different surface textures are provided for each shape — smooth, striped, and checkered — the last two being incised into the surface of the beads. Each set of three shapes has two identically textured surfaces. The stringer consists of a white nylon cord with a wooden stop at one end and a pliable nylon tip at the stringing end.

The purpose of the beads and stringer is to introduce the kindergarten-early primary level child to: a. Solids of three different common shapes, sizes and textures; b. Bead-stringing on a gross, easily managcable level, for the purpose of developing muscular coordination.

Contents of Set:

12 wooden beads:

4 cubes, $1\frac{1}{2}$ " x $1\frac{1}{2}$ " x $1\frac{1}{2}$ ", all painted bright red, including 2 with smooth surfaces, and 1 each with striped and checkered surfaces.

4 rectangular solids, $2\frac{1}{2}$ " x 1" x 1", all painted bright yellow, including 2 with striped surfaces, and 1 each with smooth and checkered surfaces.

4 cylinders, $2\frac{1}{2}$ " long x $1\frac{1}{4}$ " in diameter, all painted light blue, including 2 with checkered surfaces, and 1 each with smooth and striped surfaces.

1 stringer — made of white nylon cord, $\frac{1}{8}$ " in diameter, 34" long, with a 6"-long pliable nylon tip.

Giant Textured Beads (sold in complete sets only) . Cat. No. **1-0378**.

Stringer Replacements. Cat. No. **1-0379**.

Suggested Uses:

1. At first, present the string with one or a few beads on it, as something to play with or grasp. Gradually add beads, until they all are on the string. Encourage any visual interest shown. Note the colors which attract the child's attention, and tell him their names.

2. Using the large work-play tray (APH Cat. No. **1-0376**), remove the beads from the string and let the child play with them on the tray. (Let the child help you remove the beads from the string.)

3. Give the child one set of beads of like color and shape. Tell him the name of the shape. Encourage him to find the two beads of the same shape which have the same surface texture. Tell him the names of the different textures (smooth, striped, checkered), and teach him to learn to distinguish between the textures. Do the same with the two other shapes separately.

4. Give the child the entire set of beads — unstrung — to play with, and help him to distinguish between the different shapes regardless of surface texture, as well as different surface texture regardless of shape.

5. Teach him how to string the beads. This, generally, will be a much more difficult learning task than to unstring the beads, as he learned in No. 2 above. If he has sufficient vision, show him visually how to string. If he has no useful vision, help him to learn the stringing process by putting your hand over his and moving his, within yours, through the motions.

6. After the child has learned to string the beads, he can learn to think in terms of specific tasks involving stringing — by color, form, surface design, number, mixed combinations (2 yellow beads, 4 cubes, 3 blue, 3 different shapes, and so on.) Each of these tasks will require the learning of the concepts involved, along with the development of the necessary muscle control to do the actual stringing itself. Note, however, that the learning of these tasks should *never* be hurried.

7. Colors, numbers, and forms of the beads can be related to *like* colors, numbers, and forms in the child's own *observable* environment. Remember, however, that the child with *little or no vision* will need more time to see that a cylindrical "rolled oats" box and the cylindrical bead are alike in form, although different in size and texture, or that a cube bead and a large square (cube) box are alike, since this kind of concept utilizes vision to a great extent to expedite its understanding.

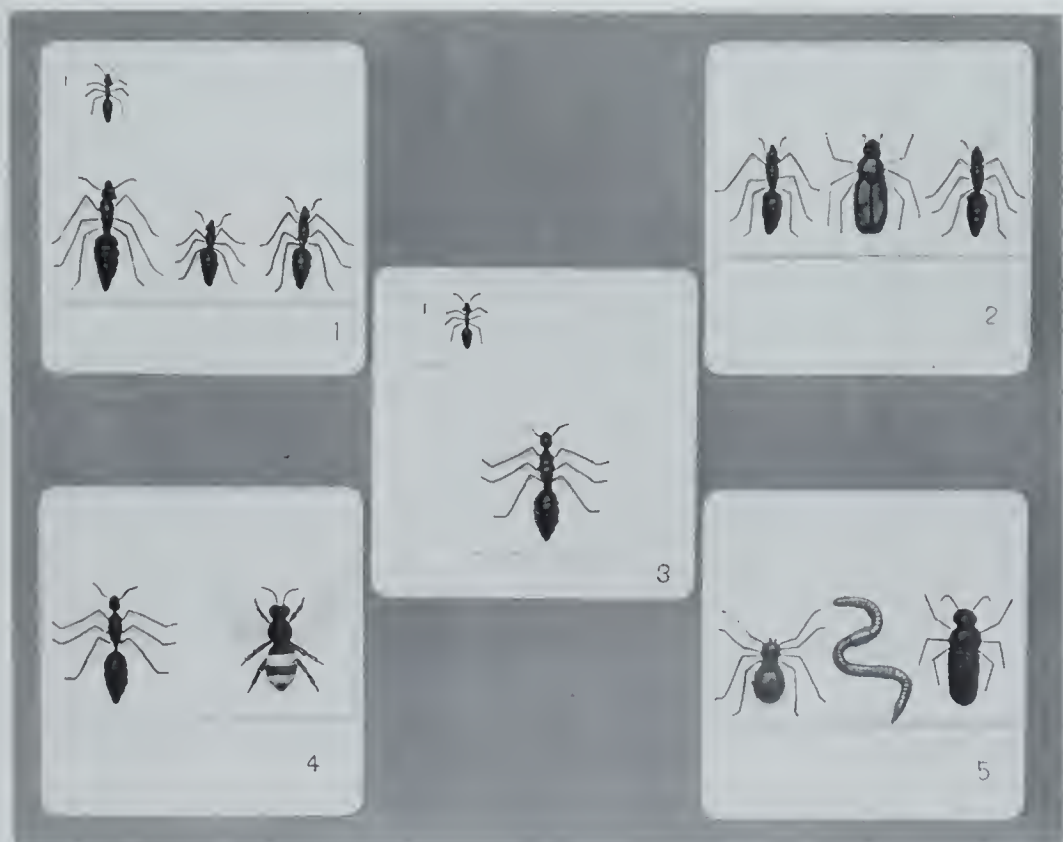
8. These beads (the child's playthings) should be explained as only *one kind of bead*; mother's beads — smaller, different to the touch and to the eye, etc. — are another. Through teaching the concept that a bead is an object, large or small, which has a hole (or holes) through it which makes it possible to string it on a thread or cord, the child can begin to understand that the same word can have several meanings, that objects of the same name can serve different purposes, etc.

9. The above activities should supplement the teacher's creative use of this instructional aid. Free play and times when several children are interacting afford other opportunities for incorporating the beads into the learning process.

Visual abilities are not essential to the use of the giant beads. However, holding things close to the eyes indicates visual interest and awareness on the child's part, and such use of residual vision should be encouraged and developed.

As the child is guided in the use of the beads, attention should be devoted to the expansion of his vocabulary. First, talk to him in terms or words he understands. Then add new words, making certain that the child develops an awareness of the concept or meaning of each new term.

INSECT IDENTIFICATION KIT



Manufactured by
American Printing House for the Blind
1839 Frankfort Avenue
P. O. Box 6085
Louisville, Kentucky 40206

INSECT IDENTIFICATION KIT

The Insect Identification Kit was developed to teach the body parts of insects to young primary level visually handicapped students, to encourage students to examine and distinguish differences and likenesses in insects, and to reinforce identification of the insect which appears in illustrations with other small invertebrates in primary grade science books.

The aid consists of five vacuum-formed plastic sheets illustrating insects. The vacuum-formed insect models range from 1½" to 3½" in length on an overall 11" x 11" plastic sheet. The maximum height the insect models rise above the plastic sheets is one-half inch. The insect models are colored black and appear on a white background to maximize contrast for use by subjects with minimal residual vision. Small invertebrates other than the insect are presented in contrasting colors (e.g., spider-brown, earthworm-red) on a white background.

Note: It is recommended that students examine the legs of each insect using only an index finger. Raising the insects' legs to appropriate heights has caused a webbing effect between the top of the legs and the base of the model which is discriminable if more than one finger is used for examining the legs.

SUGGESTED ACTIVITIES FOR USE WITH THE INSECT IDENTIFICATION KIT

The following exercises form a program of information which is sequentially developed to familiarize the student with the characteristics of insects.

SHEET I - IDENTIFYING SIZE DIFFERENCES OF INSECTS

Instructions to student:

1. Examine Sheet I.
2. Locate the raised line in the upper left-hand corner of the sheet. (Explain that the line shows the length of a life-size ant.)
3. Locate and examine the ant which is to the right of the raised line. (Explain that the ant is four times larger than life size.)

4. Locate and examine the three ants placed in the center of the sheet. (Explain that the ants are approximately ten times larger than life size.)
5. Locate the smallest ant. Identify the ant as an insect.
6. Locate the largest ant. Identify the ant as an insect.
7. Locate the medium size ant. Identify the ant as an insect.

SHEET II - IDENTIFYING LIKENESSES AND DIFFERENCES OF INSECTS

Instructions to student:

1. Examine Sheet II.
2. Direct the student to examine each insect on the sheet. (Explain that the insects are much larger than life size.)
3. Identify the two insects which are alike. (Explain that these insects are ants.)
4. Identify the insect which is different. (Explain that this insect is a beetle.)

SHEET III - IDENTIFYING AND LOCATING THE BODY PARTS OF THE INSECT

Instructions to student:

1. Examine Sheet III.
2. Locate the raised line in the upper left-hand corner of the sheet. (Explain that the line shows the length of a life-size ant.)
3. Locate and examine the ant which is to the right of the raised line. (Explain that the ant is four times larger than life size; the ant is an insect.)
4. Locate and examine the ant which is in the center of the sheet. (Explain that an ant is an insect.)
5. Locate and name the body parts of an insect. (Assist the student to locate and associate a name with each body part.)
 - a. Head smallest body part
 - b. Thorax middle body part
 - c. Abdomen or Stomach largest body part
 - d. Two Antennae or Feelers attached to the head
 - e. Six Legs attached to the thorax
6. Define an insect as having three body parts, two antennae/feelers, and six legs.

SHEET IV - IDENTIFYING INSECTS WITH WINGS

Instructions to student:

1. Examine Sheet IV.
2. Examine the insect on the left side of the sheet and identify the insect as an ant.
3. Examine the insect on the right side of the sheet and identify the insect as a bee.
4. Notice that some insects have wings; the ant does not have wings but the bee does have wings.
5. Locate the wings on the bee.
6. Identify the ant and the bee as insects.

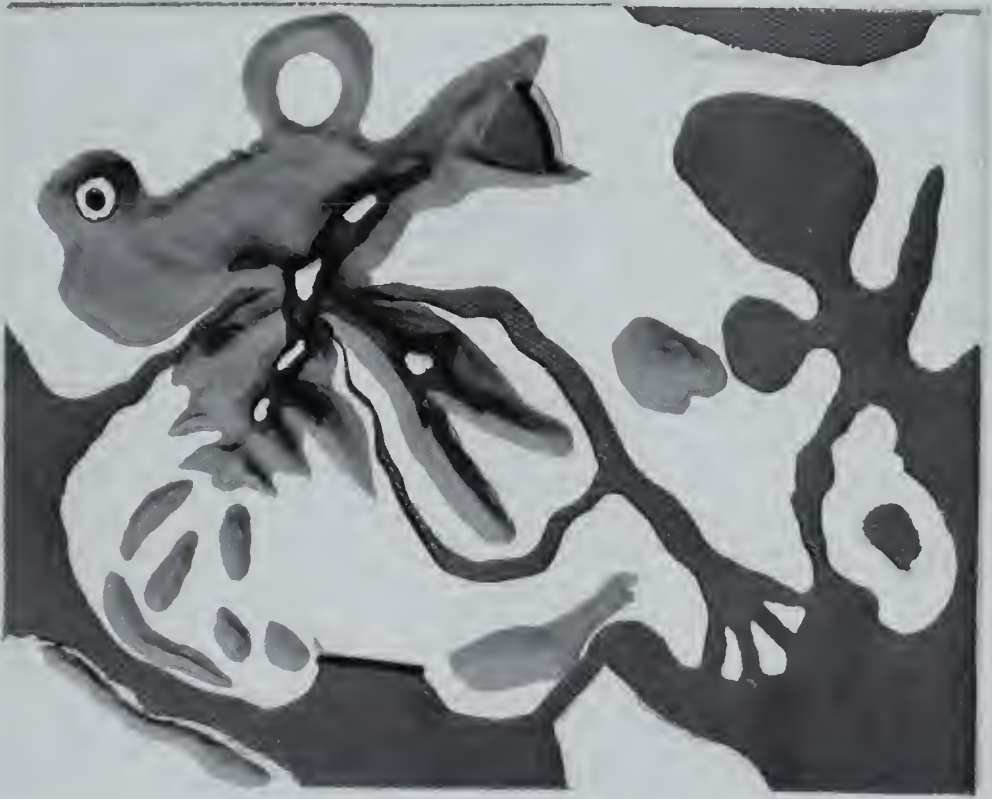
SHEET V - IDENTIFY THE INSECT

Instructions to student:

1. Examine Sheet V.
2. Examine each model on the sheet. (Explain that on the sheet there is an insect, a spider, and an earthworm.)
3. Choose and examine the insect.
4. Answer the following questions:
 - a. How many main body parts does an insect have? Ans: 3
 - b. How many antennae/feelers does an insect have? Ans: 2
 - c. How many legs does an insect have? Ans: 6
 - d. Identify the insect. Ans: beetle
5. Name and locate each of the insect's body parts.
6. Compare and discuss the difference between the insect and the earthworm; insect and the spider.
 - a. Earthworm - invertebrate, one body part, no legs, no antennae/feelers.
 - b. Spider - invertebrate, two body parts, eight legs, no antennae/feelers, two eyes.

Catalog No. 1-0326.

LANDFORM MODELS



Composite II

Manufactured by
American Printing House for the Blind
1839 Frankfort Avenue
P. O. Box 6085
Louisville, Kentucky 40206

LANDFORM MODELS

The Landform Models were developed by the Educational Materials Research and Development Section, IMRC, APH, as supplementary aids for teaching basic geographical concepts to visually handicapped students. The set of three-dimensional tactual maps (landforms) illustrates 40 geographical concepts which are introduced in the elementary social studies curriculum. These concepts were found to be largely unknown at various grade levels (Franks and Nolan, 1970; Franks and Nolan, 1971).

Although the Landforms may be considered superior to existing raised-line drawings in Braille textbooks, their ultimate value will be determined by the teacher's expertise in integrating them with concrete experiences and with the student's interaction with a variety of geographical features.

CONTENTS AND PRICE OF THE SET

The set consists of eight individual landforms eight inches square with a maximum rise of $2\frac{3}{8}$'s inches and two composite landforms 16 by 20 inches with a maximum rise of $1\frac{1}{2}$ inches. All landforms are constructed of 15 mil, high-impact styrene and are coded chromatically as well as tactually.

The landforms are described in the following section.

Cat. No. 1-0332. (sold in complete sets only).

LANDFORM 0

INTRODUCTION

Purpose

The purpose of Landform 0 is to introduce the chromatic and textural differences in land and water as indicated on landforms and to determine whether the student utilizes residual vision, tactual discrimination, or a combination of these in identifying land and water areas.

Geographical concepts introduced

- * 1) Land (yellow, smooth, small)
- * 2) Water (blue, rough, large)

Note: Explanatory information is included in parentheses when colors are introduced (Landforms I-III).



LANDFORM I

SIMPLE LAND AND WATER MASSES

Purpose

The purpose of Landform I is to introduce to visually handicapped students the concepts of land and water on landforms, and specifically to teach the concepts enumerated below.

Geographical concepts presented

- * 1) Ocean
- * 2) Island
- * 3) Lake
- * 4) Seashore (coast, coastline)
- * 5) Beach



LANDFORM II

SIMPLE LAND MASSES

Purpose

The purpose of Landform II is to introduce visually handicapped students to differences in elevation of simple land masses on landforms, and specifically to teach the concepts enumerated below.

Geographical concepts introduced

- * 1) Hill (green, high, rounded top)
- * 2) Mountain (red, higher, pointed top)
- * 3) Valley (yellow, low, wide)
- * 4) Canyon (yellow, low, narrow)
- * 5) Reservoir (blue, rough)



LANDFORM III

OPEN LAND AREAS

Purpose

The purpose of Landform III is to introduce to visually handicapped students concepts of space and open areas on landforms, and specifically to teach the concepts enumerated below.

Geographical concepts presented

- * 1) Basin (yellow, very low, bowl-shaped)
- * 2) Plain (yellow, low, very wide)
- 3) Prairie (yellow, low, very wide)
- * 4) Plateau (green, high, flat)



LANDFORM IV

WATER AREAS

Purpose

The purpose of Landform IV is to teach visually handicapped students relative sizes and outlines of partially enclosed bodies of water as they may appear on landforms, and specifically to teach the concepts enumerated below.

Geographical concepts presented

- | | |
|--------------|-----------|
| * 1) Channel | 5) Harbor |
| * 2) Canal | 6) Port |
| * 3) Gulf | |
| * 4) Bay | |



LANDFORM V

RIVER AREAS

Purpose

The purpose of Landform V is to teach visually handicapped students the origin and directional flow of rivers and the following related concepts.

Geographical concepts presented

- * 1) River
- 2) Tributary
- * 3) Source of a river
- * 4) Mouth of a river
- 5) Delta
- 6) River basin



LANDFORM VI

HILLS AND MOUNTAINS

Purpose

The purpose of Landform VI is to give visually handicapped students a greater range in discriminating various levels of elevation on landforms, and specifically to teach the concepts enumerated below.

Geographical concepts presented

- 1) Volcano
- 2) Mountain peak (white, highest point)
- 3) Range of mountains
- 4) Highland
- 5) Foothills
- 6) Divide
- 7) Timberline



LANDFORM VII

ADDITIONAL LAND AND WATER AREAS

Purpose

The purpose of Landform VII is to provide visually handicapped students discrimination of additional basic geographical concepts which are illustrated on landforms, and specifically to teach the concepts enumerated below.

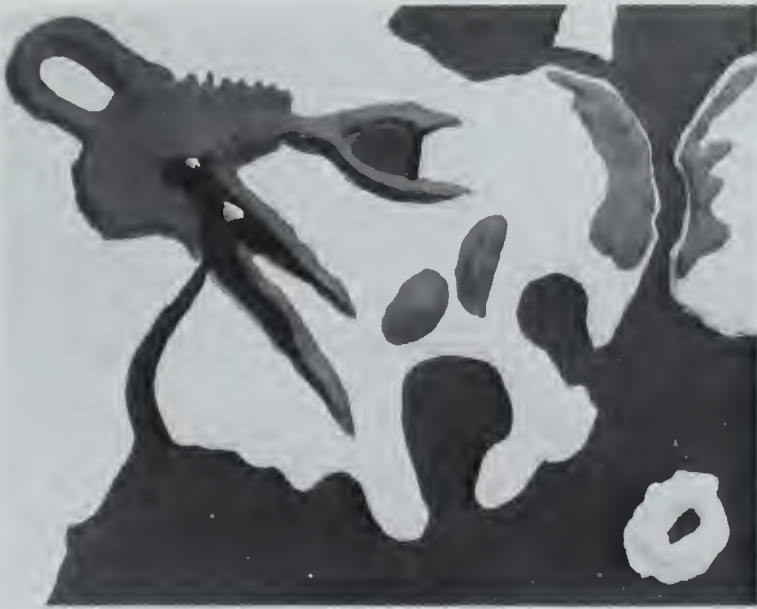
Geographical concepts presented

- 1) Peninsula
- 2) Cape
- 3) Isthmus
- 4) Strait
- 5) Sound
- 6) Inlet
- 7) Dike



COMPOSITE I

The 20 starred (*) items on Landforms I through V are geographical concepts which appear on Composite I. The starred items represent geographical concepts which are suitable for introduction to young visually handicapped students. These twenty items were tested with primary grade students (grades 1-3) and were found to be highly discriminable (Franks and Baird, 1971b).



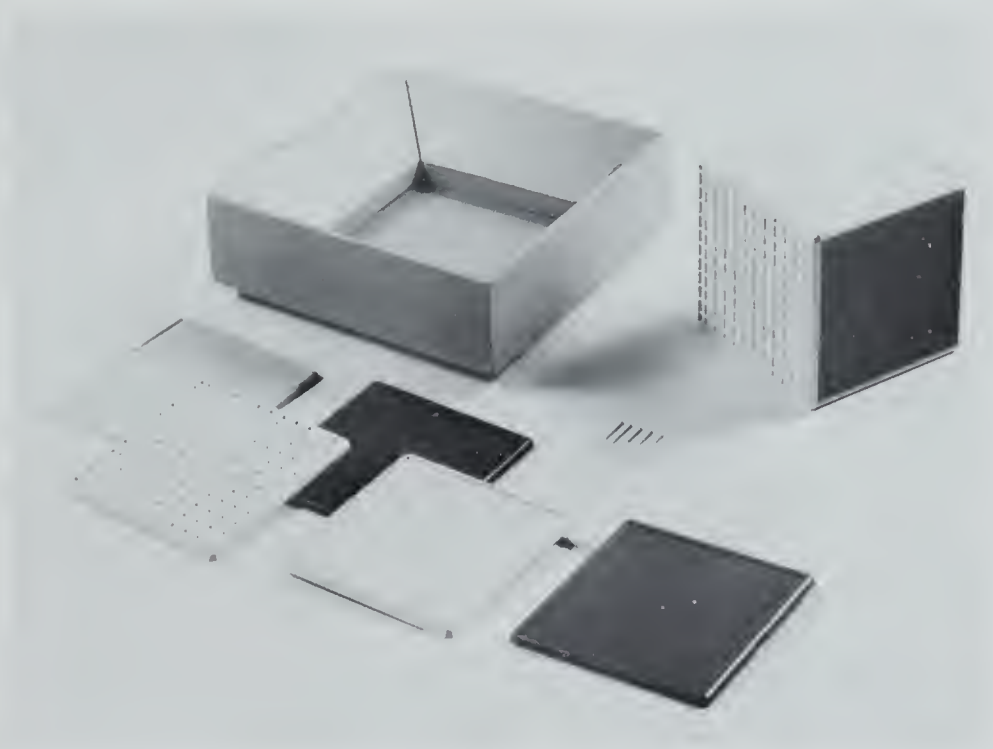
COMPOSITE II

All 40 items on Landforms I through VII are illustrated on Composite II. The items were found highly discriminable tactually and chromatically. A number of legally blind students with minimum residual vision were found to use visual (color) cues rather than tactual cues in their examination of landforms, when both types of information were available. (Franks and Baird, 1971a).

REFERENCES

- *Franks, F. L. and Baird, R. M. Geographical concepts and the visually handicapped. *Exceptional Children*, December, 1971a.
- Franks, F. L., and Baird, R. M. Teaching geographical concepts to young visually handicapped students, 1971b. Submitted for publication to *Teaching Exceptional Children*.
- Franks, F. L., and Nolan, C. Y. Development of geographical concepts in blind children. *Education of the Visually Handicapped*, March, 1970a.
- Franks, F. L., and Nolan, C. Y. Measuring geographical concept attainment in visually handicapped students. *Education of the Visually Handicapped*, 1970b, May, 1971b.

LARGE TEXTURED BLOCK



Manufactured by

American Printing House for the Blind

1839 Frankfort Avenue

P. O. Box 6085

Louisville, Kentucky 40206

LARGE TEXTURED BLOCK

DESCRIPTION

Each block unit consists of:

one 3 inch cube with sides of four colors (red, yellow, blue and white) and four textures (raised parallel lines, grid, raised dots and smooth)

one frame

six 3" x 3" plane insets which are duplications of each side of the cube.

SUGGESTED USES

The large textured block is recommended for use by the kindergarten-early primary level child or the older child with multiple handicaps. It is designed with four colors and four textures for simple matching and comparisons. The frame incorporates a homing principle so that a very young child, or a child with multiple handicaps can fit the block into it with very little difficulty. Accompanying the frame and block are plane insets of each color and texture used in the block. The insets can be placed in the frame for duplication purposes.

Some of the purposes for which the large textured block can be used are as follows:

1. It can first be used much like a toy, to be played with and manipulated as any set of blocks would be used.
2. Development of gross motor dexterity
 - a. The block is of appropriate size to be used in developing grasp.
 - b. The turning of the block for correct position helps to develop manual dexterity.
3. Sensory Development
 - a. Visual — The colors can be matched in various ways by children with enough vision for this purpose. This activity will aid in the development of color identification and discrimination.
 - b. Tactual — The various textures of the sides of the blocks

can also be matched as a means of developing the ability to discriminate tactually and to identify different kinds of textures.

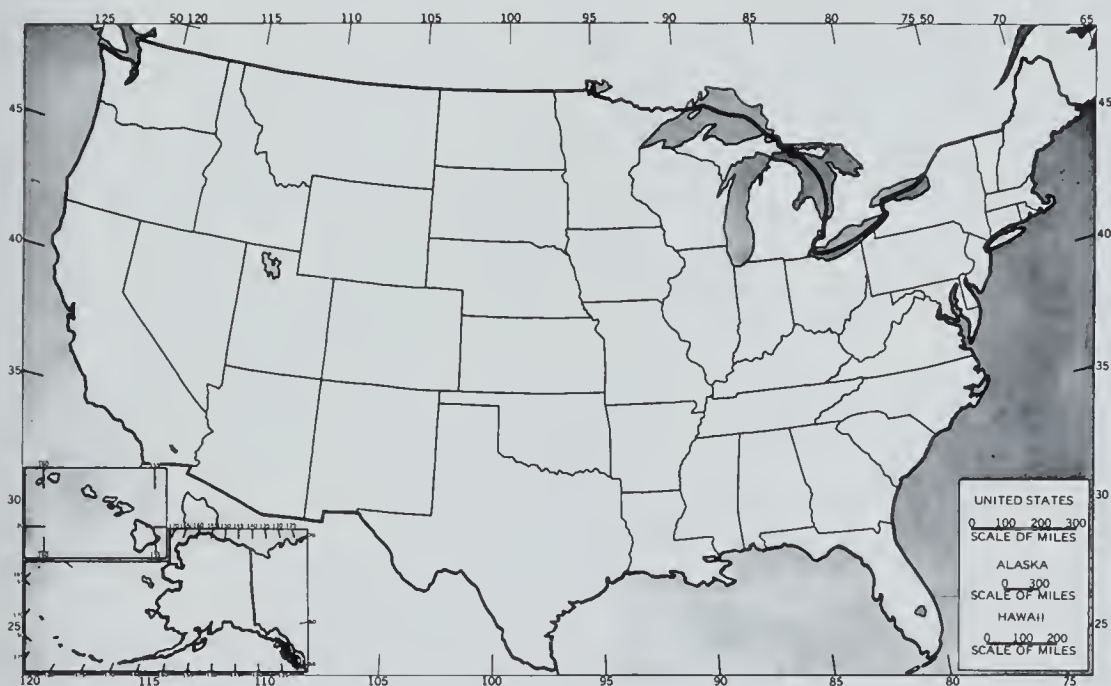
4. Cognitive Development

- a. The concepts of "same and different" or "like and unlike" can be developed in activities involving the different colors and textures of the sides of the blocks.
- b. Memory sequencing can be developed by having the child reproduce or recall the sequence of colors or textures from patterns set up by the teacher.
- c. Number concepts can be taught when the child is ready for this type of learning experience.

Although blocks may be ordered individually, it is recommended that a minimum of three blocks be ordered.

Catalog Number 1-0382

LARGE TYPE OUTLINE—MAPS (DESK SIZE)



AMERICAN PRINTING HOUSE FOR THE BLIND
Louisville, Kentucky
1973

ADAPTED FROM NYSTROM
SERIES OF DESK MAPS

Manufactured by
American Printing House for the Blind
1839 Frankfort Avenue
P. O. Box 6085
Louisville, Kentucky 40206

LARGE TYPE OUTLINE—MAPS (DESK SIZE)

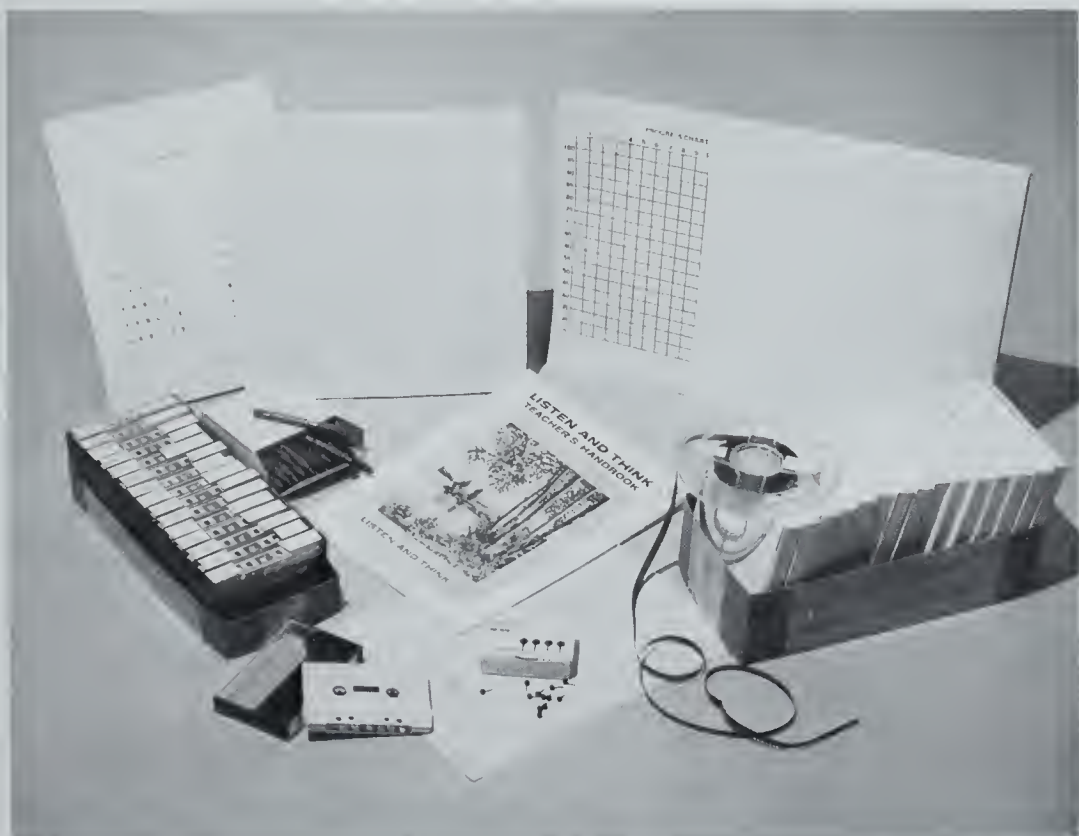
The Large Type Outline desk maps have been adapted from the Nystrom Series of Desk Maps. These maps range in size from 20" x 14" to 20" x 16" and are printed in black ink on a regular buff antique-finish paper. Outlines of individual states are shown in light type with bolder type enclosing an approximate geographical region. Each map has an insert which depicts the location of a geographical region in relation to the rest of the continental United States, except on the map of the United States when the inserts display Alaska and Hawaii. Longitude and latitude (West of Greenwich) lines are also shown on the maps and are placed on the borders of each map but do not dissect the map. A linear scale is included on each map with scale indicated in miles.

Catalog Numbers:

1-0161--LT Map	Central Atlantic
1-0162--LT Map	Eastern United States
1-0163--LT Map	Kentucky
1-0164--LT Map	Louisiana State
1-0171--LT Map	Mississippi Valley
1-0172--LT Map	New England
1-0173--LT Map	North Central States
1-0174--LT Map	North Eastern States
1-0185--LT Map	North Western States
1-0186--LT Map	South Atlantic
1-0187--LT Map	South Central
1-0188--LT Map	Southern States
1-0189--LT Map	Western States
1-0190--LT Map	United States

"LISTEN AND THINK"

Adapted Taped Lesson Program



Manufactured by
American Printing House for the Blind
1839 Frankfort Avenue
P. O. Box 6085
Louisville, Kentucky 40206

“LISTEN AND THINK”

Adapted Taped Lesson Program

Educational Developmental Laboratories has granted the American Printing House for the Blind special permission to adapt these tapes for use with visually handicapped students. EDL designed the program for the purpose of improving listening comprehension and developing specific thinking skills that are necessary to good listening. It is presented in such a way as to call upon the student to use analytical, interpretive, appreciative, and critical skills in a carefully planned progression. Lesson activities give the student practice in such skills as: Listening, Identifying Main Ideas, Recognizing Sequence, Summarizing, Classifying, Outlining, Comparing, Recognizing Cause and Effect, Predicting Outcomes, Using Our Senses, Visualizing, Understanding Character, Understanding Setting, Sharing Feelings, Enjoying Humor, Recognizing Climax, Recognizing Foreshadowing, Recognizing Purpose, and Distinguishing Between Fact and Opinion.

The taped lessons, requiring from 30 to 45 minutes, should be depicted as only one part of the total program. The *Teacher's Handbook*, an especially valuable tool, gives synopses of the lessons and suggestions for coordinated activities which could be used before or after the taped lesson.

Speeded listening is used in the Listen and Think series. This technique is made possible by means of special recording equipment which quickens speech electronically without making it distorted. The stories presented with the use of the speeded listening technique are at a rate slightly faster than the reading rate for the grade level.

The *Adapted Taped Lessons* have an integrated question-activity section and employ a response method which can be readily used by the visually handicapped student. Separate answer sheets for each student are required. One of the most significant features is that students can use the taped lessons independently (whether on open-reel or cassette tapes). Only a minimum of Braille or large type skills are required; therefore, students who are not proficient in reading and writing Braille or ink print may also participate.

The *Answer Sheets* (Braille or large type) provide a simple method of responding to auditory questions. Each sheet is numbered 1-20, with answer choices labeled a, b, c, d, and e. For either the Braille or large-type answer sheet, a plastic crayon is provided. In the case of the Braille user, the marker should be used to erase the Braille letter, which helps the student to check his own answers. The large-type user simply marks the letter which represents the correct answer.

The *Progress Charts* (Braille or large-type) provide a means whereby students can study their progress on a series of lessons or tests. Each sheet is numbered 1-15, consecutively, on the horizontal axis, with 25 to 100 percentile scores (by units of 5) on the vertical axis.

Braille charts are embossed with horizontal and vertical lines of Braille dots on white $11\frac{1}{2}$ " x 11" Braille paper. Vertical line-spacing is $\frac{5}{8}$ " and horizontal spacing is $\frac{1}{2}$ ".

Large type charts are printed with bold black lines at a $\frac{1}{2}$ " vertical and horizontal spacing, on white $8\frac{1}{2}$ " x 11" paper.

These charts may be mounted on bulletin boards or corrugated cardboard. Scores may be plotted by the student or teacher with commercially available map-marking pins or small tacks. Young students will be able to read the scores plotted by the teacher, but more advanced students can both plot and read their own scores. This can be a good introduction to work with graphing.

Materials provided in the adapted program include:

- 15 Revised Taped Lessons (reel or cassette, 20-30 minutes each)
- 250 Braille Answer Sheets (reorder APH Cat. No. 5-0676)
- 250 Large Type Answer Sheets (reorder APH Cat. No. 4-0103)
- 36 Plasti-crayons (18 red and 18 blue)
- 1 Tape: "How to Use Your Answer Sheet"
- 50 Braille Progress Charts (reorder APH Cat. No. 5-1717)
- 50 Large Type Progress Charts (reorder APH Cat. No. 4-1204)
- 300 Marking Pins
- 1 Teacher's Handbook
- 1 Suggestions for Use of the Adapted Program

INFORMATION FOR ORDERING

1. Entire Kit:

Level	Recommended Grade Range	Open-reel Program Cat. No.	Cassette Program Cat. No.
B*	II-V	1-0388	1-0389
C	III-VI	1-0390	1-0391
D*	IV-VII	1-0394	1-0395
F	VI-IX	1-0392	1-0393

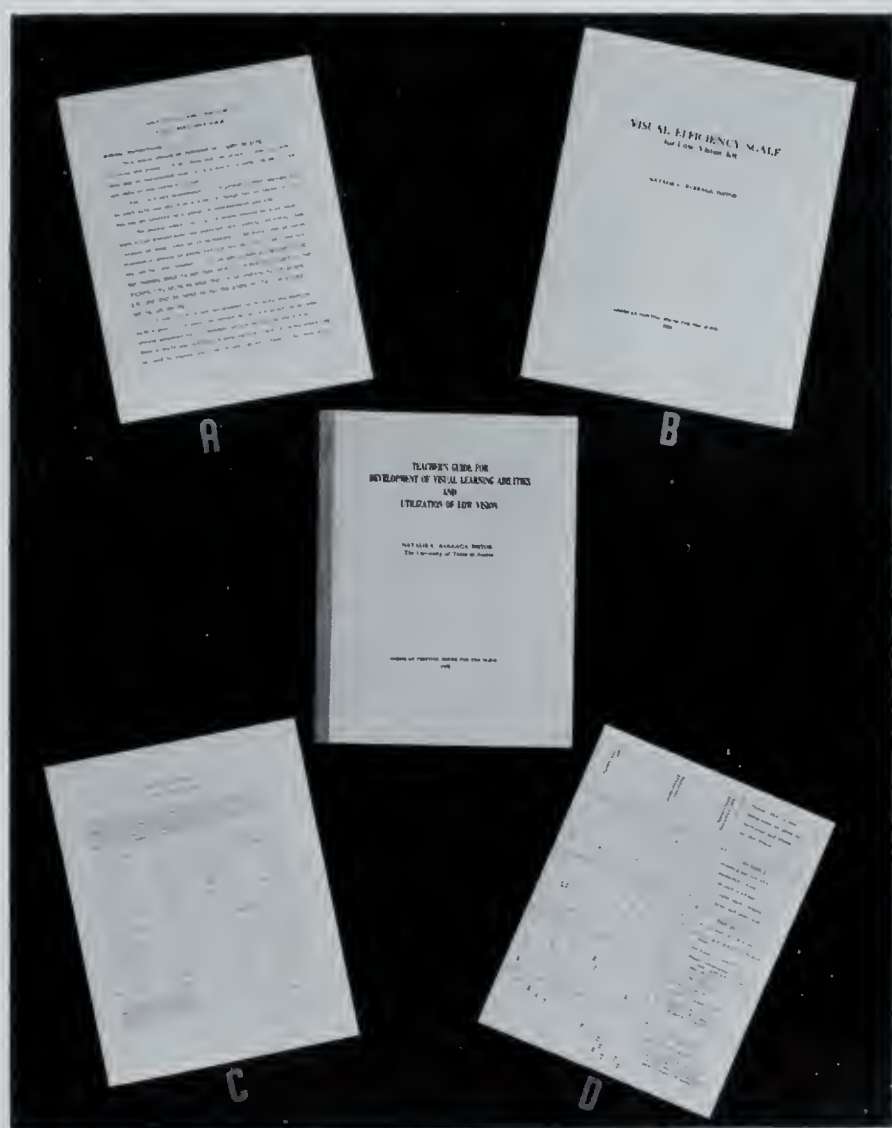
2. Reorders:

	Level	Open Reel Cat. No.	Cassette Cat. No.
Complete Set of 16 Tapes	B*	2-9988	2-9989
	C	2-9990	2-9991
	D*	2-9994	2-9995
	F	2-9992	2-9993
Single Tape Replacements	B*	2-9988 plus lesson no.	2-9989 plus lesson no.
	C	2-9990 plus lesson no.	2-9991 plus lesson no.
	D*	2-9994 plus lesson no.	2-9995 plus lesson no.
	F	2-9992 plus lesson no.	2-9993 plus lesson no.
Multiple-choice Multiple-purpose Answer Sheets	Braille Cat. No.		Large Type Cat. No.
	5-0676		4-0103
Progress Charts:		5-1717	4-1204

Plasti-Crayons and **Marking Pins** are available at most school suppliers. The **Teacher's Handbook** is available through local distributors of Educational Developmental Laboratory materials. From the Printing House, these items are available only when purchasing the entire kit.

*Scheduled to be available by Fall of 1973. Additional levels of this program will be made available at a later date.

MATERIALS on UTILIZATION OF LOW VISION



Published by

American Printing House for the Blind

1839 Frankfort Avenue

P. O. Box 6085

Louisville, Kentucky 40206

MATERIALS ON UTILIZATION OF LOW VISION

Increasingly, there is concern regarding the maximal use of low vision as a part of the child's total learning potential. Dr. Natalie Barraga has edited the materials here presented by the American Printing House for the Blind, in the belief that when a child's "vision is impaired in the eye, he must be led carefully step-by-step in his visual development and taught how to use the vision he has and to understand what he is able to see." Further, she feels that the development of visual abilities to their greatest efficiency is based upon the understanding and acceptance of the following:

Development of visual ability is not innate and automatic.

Visual ability is neither determined nor estimated by visual acuity measures ALONE.

Visual ability and functioning are not related necessarily to the KIND nor to the DEGREE of impairment.

Visual ability and efficiency MAY BE LEARNED through a SEQUENTIAL program of visual experiences.

This set of APH materials is designed to assist the teacher in:

Understanding the general objectives related to visual development.

Assessing the level of visual functioning of each low-visioned child.

Identifying specific visual behaviors for development.

Sequencing a variety of experiences and activities to promote visual learning.

Selecting and using materials appropriate for development of visual learning abilities.

The materials consist of two kits which can be purchased separately — The Teacher's Kit (ULV) and the VES Kit, which contain the following:

Teacher's Kit (ULV) (1 copy of each of the following) :

VISUAL EFFICIENCY SCALE (VES)
Directions for Administration of VES
Profile Sheet (for charting visual performance)
Record of Performance on VES
TEACHER'S GUIDE for Development of Visual Learning Abilities and
Utilization of Low Vision

Ves Kit:

1 copy Directions for Administration of VES
10 copies VISUAL EFFICIENCY SCALE (VES)
10 copies Profile of Visual Skills and Behavior
10 copies Record of Performance

Catalog Numbers:

Teacher's Kit (ULV). Cat. No. 8-5060.

VES Kit. Cat. No. 8-5059.

DESCRIPTION AND PURPOSES

In using these materials, it is not recommended that a teacher attempt to initiate a program without FIRST being thoroughly acquainted with all the materials in the Teacher's Kit (see list above and picture on front cover).

Thorough study of the TEACHER'S GUIDE is basic to the entire program. In this guide, Dr. Barraga attempts to assist the teacher in determining whether a child is utilizing fully his residual vision and in planning realistically for that child. The Preface, Introduction, and General Objectives provide background for the teacher's understanding and motivation. Details of preparation procedures, specifics of visual stimulation activities, and an outline of activities for each objective in sequencing is included. The most appropriate materials for use in attaining each objective are listed. The appendix section includes a glossary of related terms and a list of Visual Behaviors related to the 48 items of the VISUAL EFFICIENCY SCALE. Three actual case records are shown, along with the resulting recommended prescriptive Teaching Model for each case. (It may be noticed that the Record of Performance on VES shown in the case examples

varies in some answers from the Record of Performance sheets included in the APH kits. This is due to some changes in items used in the revised VES. However, the Visual Behavior Task does not vary and, therefore, should not confuse the individual teacher in making use of the Profile Sheet and the Prescriptive Teaching Models). A Materials List, with the addresses of the sources, and a Bibliography complete this 73-page TEACHER'S GUIDE.

The Test Kits will be needed in numbers according to the number of children whose visual efficiency is to be assessed. One copy of the Directions for Administration (Item A) and 10 copies each of Items B, C, and D complete this package. (See cover picture and descriptions below.)

Item A — Directions for Administration of Visual Efficiency

Scale: Includes General Instructions, Specific Instructions, and Item-by-Item Directives. The "Do's and Don'ts," along with the EXACT words for each of the 48 assessment items on the SCALE make this very useful to the teacher not comfortable with such procedures.

Item B — Visual Efficiency Scale: One copy for each child whose visual efficiency is being assessed. The child holds the SCALE as close to his eyes as he wishes and marks on the SCALE itself.

Item C — Record of Performance on Visual Efficiency Scale:

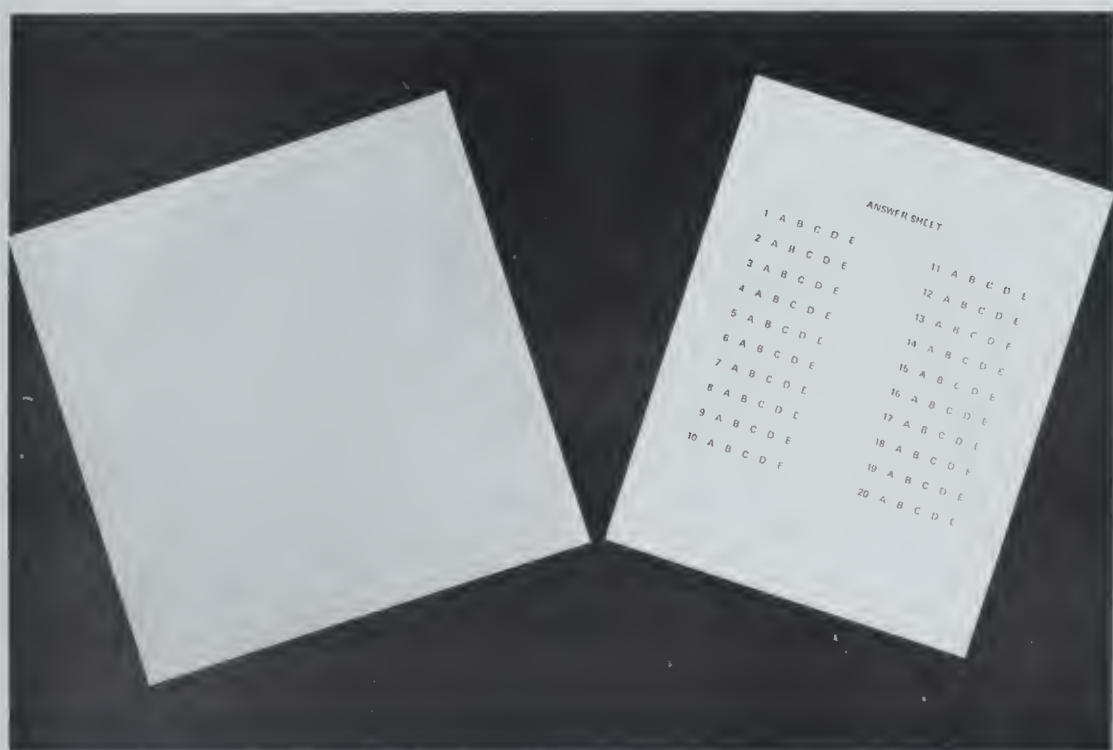
One copy for each child whose visual efficiency is being assessed. As indicated above, this does not correspond in all details to those pictured in the TEACHER'S GUIDE. The Sections, numbered with Roman numerals, correspond to those on the Profile Sheet. The Arabic numbers, used for item numbering, also correspond to those on the Profile Sheet. Both numbers are used in planning the Prescriptive Teaching for each child.

Item D — Profile: Visual Skills and Behaviors:

One copy for each child whose visual efficiency is being assessed. When the results from the Record of Performance (Item C) are charted on the individual Profile Sheet (Item D), the teacher can determine in which areas the child's visual behaviors and skills are low, marginal, or satisfactory. Using these results, the teacher can plan the prescriptive teaching needed by each child. Reference to the above listed contents of the TEACHER'S GUIDE for such planning brings the work "full circle."

MULTIPLE-CHOICE, MULTIPLE-PURPOSE ANSWER SHEETS

Braille and Large Type



Manufactured by

American Printing House for the Blind

1839 Frankfort Avenue

P. O. Box 6085

Louisville, Kentucky 40206

MULTIPLE-CHOICE, MULTIPLE-PURPOSE ANSWER SHEETS

Braille and Large Type

In many testing situations, a multiple-choice, multiple-purpose answer sheet provides a simple method of responding to auditory or printed questions of whatever nature. To meet such a generalized need, the APH now provides parallel Braille and large type sheets meeting the above need. Each sheet is numbered 1-20, with answer choices labeled a, b, c, d, and e. For either the Braille or large type answer sheet, a plastic crayon or heavy lead pencil is recommended for marking by the pupil. In the case of the Braille user, the marker should be used to erase the Braille letter, which helps him to check his own answers. The large-type user simply marks the letter which represents the correct answer.

NOTE: While these sheets will prove useful in many testing situations, they are not designed to be used in answering the questions to any achievement tests published by the Printing House. (Special answer sheets for this purpose are listed in both the Braille and large type APH catalogs.)

The Braille answer sheets are embossed on regular white Braille paper, 10 $\frac{1}{4}$ " wide by 10 $\frac{3}{4}$ " long. The large type answer sheets are printed on sheets 8 $\frac{1}{2}$ " wide by 11" long.

Catalog Numbers:

Braille Sheets. 5-0676.

Large Type Sheets. 4-0103.

PEG KIT



Manufactured by
American Printing House for the Blind

1839 Frankfort Avenue
P. O. Box 6085
Louisville, Kentucky 40206

PEG KIT

DESCRIPTION

Each kit contains:

One $8\frac{1}{4}$ " x $5\frac{1}{2}$ " x $2\frac{7}{8}$ " wooden work and storage box

Six inset frames

Three $1\frac{7}{8}$ " pegs

Six 1" pegs

The pegs in the kit vary according to size, color, and are tactually different. There are two sizes of pegs. The colors used are red, yellow and blue. Each peg has either one, two, or three grooves. Six black inset frames with holes of varying sizes and number can be placed into the black wooden box; this provides structure for matching, sorting and manipulating the pegs. The kit was so designed that no two features can be matched simultaneously.

Suggested Uses:

This peg kit is recommended for use by the preschool-early primary level child or the older child with multiple handicaps. Tasks with the peg kit may include the following:

1. **Manipulation**
 - a. putting pegs in frames
 - b. stacking
 - c. using frames as guides for drawing circles
2. **Size Discrimination**
3. **Color Discrimination**
4. **Number Concepts**
 - a. counting
 - b. adding
 - c. subtracting
 - d. beginning multiplication (concept of 2's, 3's, 4's)
 - e. beginning division concepts

5. **Language Concepts**

size, color, shape, groove, put in, take out, bigger than, smaller than, same, different, etc.

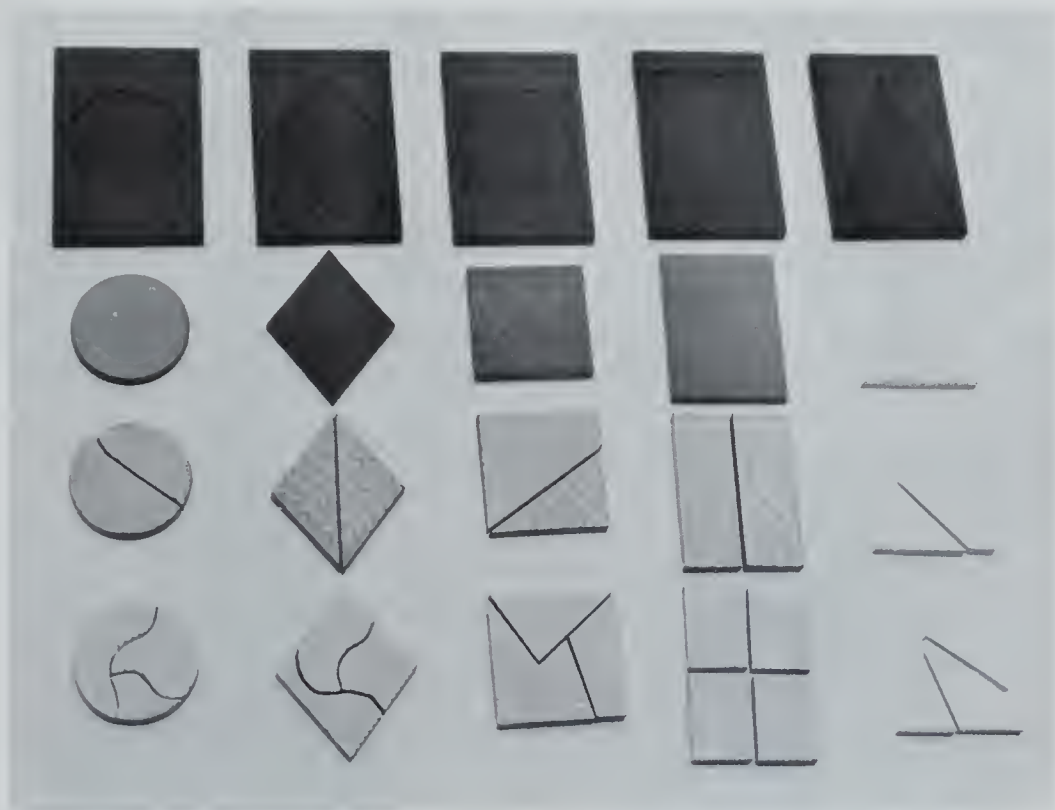
6. **Tactual Discrimination**

- a. counting number of grooves
- b. matching pegs with same number of grooves
- c. by use of tapes or tacks, the teacher can add additional tactual differences

The APH Work-play tray (Catalog No. 1-0375 or 1-0376) may be beneficial as a contained workspace when the peg kit is being used. The wooden box provides convenient storage for the frames and pegs when the kit is not in use.

Catalog No. 1-0342.

PUZZLE FORM-BOARD KIT



Manufactured by

American Printing House for the Blind

1839 Frankfort Avenue

P. O. Box 6085

Louisville, Kentucky 40206

PUZZLE FORM-BOARD KIT

The Puzzle Form-board Kit (see picture on front) consists of:

5 frames, 4" x 6" x $1\frac{1}{2}$ ", each with a different intaglio cutout section in the shape of a circle, a square, a triangle, a diamond, or a rectangle.

15 sets of shaped pieces (3 sets for each of the above shapes) which fit into the frames. Each shape is divided variously into one, two, three (and, in one case, four) puzzle pieces. The five sets of shape are painted in different colors — the circle, red; the square, blue; the triangle, yellow; the diamond, brown; and the rectangle, green. The three sets for each shape are painted in varying tones of the same color. While all of the pieces are smooth on the back, three different textures are provided for each set of shapes.

It is recommended that the APH Large Work-play Tray (**Cat. No. 1-0376**) be used when working with the kit.

The Puzzle Form-board Kit is designed for use by the pre-school or primary level child as a multi-purpose supplementary aid in learning basic concepts of form, shape, texture, color, size and manipulation. The teacher or parent will need to select only the parts of the aid which are relevant to a specific teaching situation. A child should begin with only one frame and one inset piece.

Use of the aid might best be conceived by thinking of three different phases:

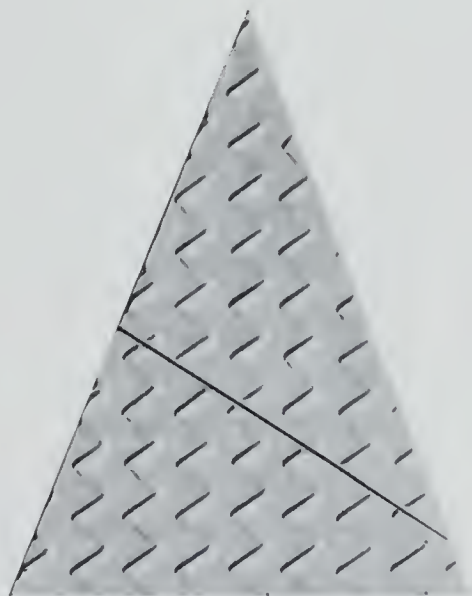
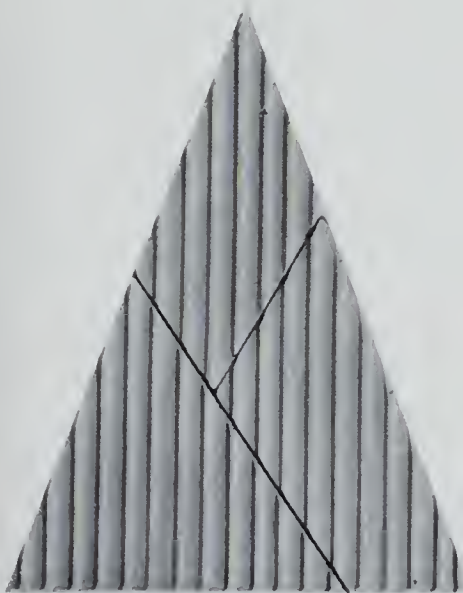
A. The first experience of the child with the kit may include:

1. Use of the frames and whole shapes as a puzzle requiring the child to place the correct piece in place in the frame.
2. Discrimination of textures by learning to place the whole shapes with either the smooth or rough side on top (or bottom).

PUZZLE FORM-BOARD KIT BROCHURE SUPPLEMENT

The segmented triangles shown on the cover of the Puzzle Form-Board Kit brochure are not the same as the segmented triangles included in the Puzzle Form-Board Kit.

Below are pictures of the segmented triangles which are included in the Puzzle Form-Board Kit.



3. Learning to identify the three primary colors of red, yellow, and blue; later adding the common colors of green and brown.
4. Practicing manual manipulation and finger dexterity by inserting the whole pieces into their proper frames.
5. *Introduction of shapes* — circle, square, triangle, rectangle, and diamond. Use the frames by themselves as well as with the shape pieces. Help the child to identify the name and shape. This could lead into the TOUCH AND TELL reading series program.

B. For the child working on a level more advanced than the preceding, the two-part shapes may be added to assist in teaching concepts such as:

1. *Form* — corner, curve, side, bottom, top, point, round, straight, angle, size, inside, outside, edge, etc.
2. *Texture Discrimination* — with a second pattern added.
3. *Color* — different shades of the same color.
4. *Parts* — shapes which have been divided into two unequal parts and some which have been divided into equal parts (halves).
5. *Matching of Shapes* — comparison of the whole pieces with those divided into two parts.
6. *Teaching of Likenesses and Differences* — use color, texture, and form for comparison, classification, and sorting.

C. Use of the puzzles with the shapes which have been divided into three or four pieces increases the complexity of the tasks given the child. Working with the pieces of two separate shapes at one time will provide a challenge for children operating at an advanced level. In this phase, the same concepts as outlined in Phase B can be taught and reinforced, but with more variety and demanding more from the child.

General Comments

The Puzzle Form-board Kit is basically a readiness aid and, therefore, is not designed to teach specific subjects such as reading and mathematics, even though certain features of the materials would promote such uses.

The visual discrimination of partially sighted children varies greatly. Thus, some colors or color combinations may be difficult to discriminate by individual children, and task goals, especially when requiring visual abilities, will vary with individual needs and abilities.

Catalog Number:

Puzzle Form-board Kit (complete set). **Cat. No. 1-0372.**

SCIENCE MEASUREMENTS KIT



Manufactured by
American Printing House for the Blind
1839 Frankfort Avenue
P. O. Box 6085
Louisville, Kentucky 40206

SCIENCE MEASUREMENTS KIT

The Science Measurements Kit was developed by the Instructional Materials Reference Center of the American Printing House for the Blind to provide equipment needed to illustrate and explain basic operations of measurement to blind students in elementary and junior high school science courses. The kit includes a number of items available from commercial catalogs which require no change for blind users. However, it was necessary to develop and/or adapt four instruments — the ruler, the spring (dial) balance, the pan balance, and the thermometer — to provide tactile reading by blind students. All adaptations were kept as simple as possible, since less sophisticated devices are required to illustrate and explain basic measurement concepts than those needed to perform precise measurement operations. All items were field-tested to prove their efficiency when used by pupils.

Contents of Kit

The kit consists of the following items, packed in a strong suitcase-shaped carrying case with handle and detachable lid, 6" x 17½" x 11½" in size, and weighing 16 pounds when packed with the instruments:

1 dial thermometer (Fahrenheit)

1 12-inch ruler with caliper guide, showing both inches and centimeters

1 spring (dial) balance, showing both grams and ounces

1 pan balance

Assorted gram weights:

1 1-gram	2 10-gram	2 100-gram
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2 2-gram	1 20-gram	1 200-gram
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1 5-gram	1 50-gram	1 500-gram
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1 overflow can

1 catch can

8 1¼-inch square blocks:

4 (with hooks) made of metal, i.e., aluminum, iron, brass, and lead

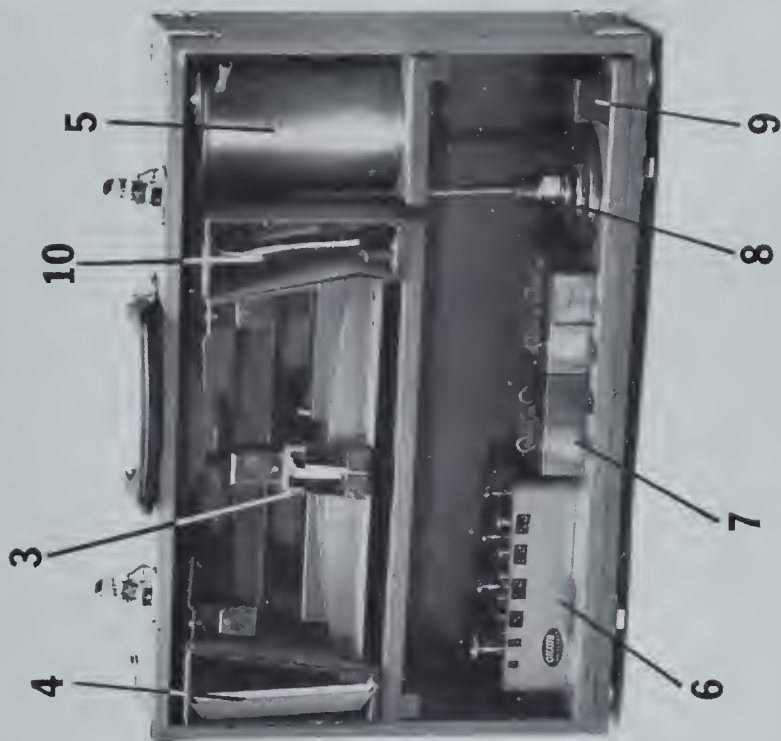
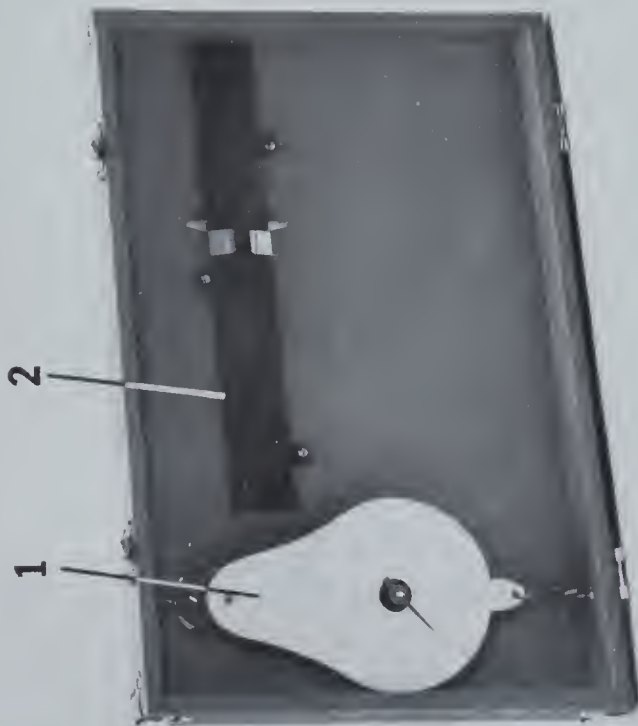
4 made of assorted materials, i.e., balsa, cork, pine, and oak

4 1-cubic-inch gravity specimens, made of metal, i.e., aluminum, iron, brass and lead

Entire Kit (sold in complete sets only) — **Cat. No. 1-0364.**

Storage Location of Items in Kit

(See numbering of devices in picture)



To open the Kit, remove the detachable lid and leave the case sitting upright.

The location of the various pieces are as follows:

Inside Cover

Spring balance (1)

Ruler (2)

Top Shelf (which is removable)

Pan balance (3) is on the left-hand side with the pans (4) themselves stored in the upright slot to the extreme left.

Overflow can, (5) which also contains the catch can, is stored to the right.

Thermometer stem extends up through a groove in the top shelf.

Bottom Shelf Tray (also removable for convenience)

Weight container (6) is on the left side. Gram weights are in two rows, with the weights beginning with 1 gram (left-front) and continuing around the container, counter clockwise, to the 500-gram weight which is located behind the 1-gram weight.

Square blocks (7) ($1\frac{1}{4}$ -inch) are located next to the right. The blocks in front are aluminum, iron, brass, and lead. The second row behind, from left to right, are balsa, cork, pine, and oak respectively. These blocks range in weight from lightest to heaviest.

Dial thermometer (8) (Fahrenheit) is next, face down, with the stem extending up through the groove in the top shelf.

Specific-gravity specimens (9), each 1 cubic inch, are located to the extreme right, and from front to back are made, respectively, of aluminum, iron, brass and lead.

Purpose and Description of Individual Instruments

Ruler (See also "Some Suggested Measurement Activities", page 7.)

The purpose of any ruler is to make linear measurements. This particular model shows both centimeters and inches, and can thus be used to teach the difference between the metric and English systems of measurements. Teaching this difference is facilitated by centimeters (upper corner) and inches (lower corner) at the left end of the ruler and progressing to the right end. With this arrangement it is simple to illustrate the concept that $2\frac{1}{2}$ centimeters are equal to approximately 1 inch.

The ruler is molded of black polystyrene plastic, and is $1\frac{1}{2}$ inches wide by approximately 1 foot in length. Of hollow construction on the back to provide flexibility and reduced weight, it is $\frac{1}{4}$ inch thick in the center, tapering down to $\frac{1}{8}$ inch at the reading edges.

Embossed lines, approximately .025" in height, show $\frac{1}{2}$ - and 1-centimeter and $\frac{1}{4}$ - and 1-inch measurements. Braille identifications are given for each two centimeters and for each inch. A spring-mounted caliper guide provides a means of pin-pointing and holding measurements for careful examination.

Spring (dial) Balance (See also "Some Suggested Measurement Activities", page 7.)

Spring balances are used to teach measurement of approximations of weights of objects. This APH model is designed to also teach the conversion of grams to ounces and vice versa.

This instrument uses a regular commercially available device, plus a special embossed plastic face, showing both ounces and grams, substituted for the regular ink-printed face. Grams are shown on the outer perimeter which has a smooth background. Ounces are shown on a sunken inner circle against a textured background, so that the two sets of measurements can be easily distinguished. Additionally, within the inner dial, touching the ends of the radii, is a smooth surface track upon which have been located four large raised dots, (.050 inches high) which indicate 4, 8, 12 and 16-ounce conversions from gram weights.

This spring balance is designed for weighing primarily in grams, although weighing in ounces can be accomplished. Thus, the forefinger can be used to find measurements indicated by the needle in grams. Then, the second finger can be used as an anchor, while the forefinger moves across to the raised ounce indicators. The third finger can then be employed for holding the original place as the forefinger moves to the smooth center track and the second finger follows over to the sunken measurements for ounces.

Pan Balance (in grams) (See also "Some Suggested Measurement Activities", page 8.)

The pan balance is designed for use when more accurate measurements of weight than those afforded by the spring balance are required. To use, an object of unknown weight is placed in the left tray and balanced with known weights placed in the right tray. An indicator (needle) rests on a center point or line on the face of the scale when the trays are in balance.

A stabilizer lever for controlling pan movements during weighing operations is located under the left-hand balance pan. By applying a light pressure, to the right or left, pan movements

can be minimized.

The APH modification of this device consists of making a generally textured background for the face, inside of which is a smooth foreground of a height of .020 inches above the background, plus a smooth vertical line raised another .019 inches above the smooth foreground. When the needle rests on the center line, it indicates "perfect" balance. If the needle is "in the rough" then weight must be added to or subtracted from the right-hand tray to achieve balance.

By placing the pulp of the finger on the center line, the balance of the trays can be felt when the needle is on the line. If the needle is off, the amount of difference and the position of the needle can be detected by slight manipulation of the pulp of the finger.

Fahrenheit (dial) Thermometer (See also "Some Suggested Measurement Activities", page 9.)

The purpose of this device is to provide blind students with an instrument for measuring changes in temperatures of water from freezing to boiling point, and for tactually observing changes in temperature that occur during phase changes in matter.

The face of the dial is 3 inches in diameter. Approximately $2\frac{1}{4}$ inch above the base, is the tactual portion of the face. Almost one quarter of the outer edge is lost in the rim. Consequently, only $\frac{1}{4}$ inch remains for the tactile portion of the face. Temperature is indicated in 10-degree units by $\frac{1}{4}$ inch lines that are approximately .039 inches high.

Both freezing point (32° F) and boiling point (212° F) are marked with large braille dots, some .050 inches high. The interval from 70° to 80° F is indicated by a textured surface raised to approximately .040 inches.

The thermometer is designed to indicate temperatures ranging from below freezing to boiling point, with emphasis on indicating points at which phase changes occur in matter. Although the thermometer was not designed for general use, it can be used to perform a number of activities in measuring temperature. The 10-degree interval between 70° and 80° enables students to measure liquids at room temperature, and serves as a reference point between freezing and boiling points.

Overflow and Catch Cans (See also "Some Suggested Measurement Activities", page 10.)

The purpose of these devices is to teach the determination of volume of small irregular objects by liquid displacement and to further illustrate density and gravity.

It has not been necessary to adapt these commercially available devices by the APH. They are, however, included in this Kit to complete its usefulness.

Weights, Blocks of Equal Volume.

These commercially available devices are designed as auxiliary equipment for some of the above instruments, and have therefore been included to complete this Science Measurements Kit.

Some Suggested Measurement Activities

Ruler

(In inches and centimeters)

Measurement Activities

1. Using the ruler as a guide, convert the following centimeters to the approximate value in inches:

- a. $2\frac{1}{2}$ cm. = _____ in.
- b. 5 cm. = _____ in.
- c. 28 cm. = _____ in.
- d. $9\frac{1}{2}$ cm. = _____ in.
- e. 21 cm. = _____ in.

2. Convert the following inches to centimeters:

- a. 10 in. = _____ cm.
- b. $5\frac{3}{4}$ in. = _____ cm.
- c. $9\frac{1}{4}$ in. = _____ cm.
- d. 1 in. = _____ cm.
- e. $3\frac{3}{4}$ in. = _____ cm.

3. Measure to the closest half-centimeter the following items in the Kit:

- a. Thermometer stem _____
- b. Depth of catch can _____
- c. Depth of overflow can _____
- d. Length of pan balance tray (edge to edge) _____
- e. Width of pan balance tray (edge to edge) _____
- f. Approximate length of the base of the pan balance _____
- g. Diameter of the bottom of each of the following weights:
 - 1) 500-gram weight _____
 - 2) 200-gram weight _____
 - 3) 100-gram weight _____
 - 4) 10-gram weight _____
 - 5) 1-gram weight _____

(Dial) Spring Balance

(In grams and ounces)

Concepts and Generalizations

1. The spring balance can be used to illustrate measurement of the pull of gravity.

2. The weight of an object can be easily approximated by hanging it from a spring balance.

Exercises

1. Using the face of the spring balance, answer the following questions:

- (a) 125 grams is almost _____ ounces (the nearest ounce indicated).

- (b) 250 grams is (more, less) than eight ounces.
 - (c) Twelve ounces is nearer which of the following: 325 grams, 350 grams or 375 grams?
 - (d) 375 grams is approximately _____ ounces.
 - (e) 500 grams is (more, less) than 17 ounces.
2. Examine the four $1\frac{1}{4}$ inch metal blocks. In order of weight from lowest to highest they are:
- (a) aluminum
 - (b) iron
 - (c) brass
 - (d) lead

Using the spring balance, approximate the weight of each of them to the nearest gram-weight.

Additional Activities

1. Attach the ring of the balance to a nail or peg. Then pull the hook downward slowly measuring, in ounces, the force exerted by the pull of the hand. Repeat until you are able to find, 4, 8, 12, and 16 ounces rapidly.

2. Measuring the pull of gravity of an object is the same as determining the object's weight. Select several common objects, weigh them, and record their weights in grams.

3. How many grams are there in an ounce?

Pan Balance

(In grams)

Concepts and Generalizations

- 1. If an object is placed on the left pan and is balanced by weights on the right, the earth's gravitational force is the same for both — the two forces are the same for each pan.
- 2. The weight of the body in the left pan is indicated by the total amount of weight in the right pan.

Exercises

- 1. Using the pan balance, weigh each specific gravity specimen. From lowest to highest weight they range:
 - (a) aluminum
 - (b) iron
 - (c) brass
 - (d) lead

Additional Activities

- 1. Using the spring balance, reweigh the $1\frac{1}{4}$ inch metal blocks. Record the weights. Now weigh each on the pan balance. Record the weights. Compare the weights. What differences in the weights of the blocks do you notice? What is the explanation for these differences?

Fahrenheit (Dial) Thermometer

Concepts and Generalizations

1. Water exists in the environment in all three states of matter: solid (ice), liquid (water), and gas (water vapor). Whenever one state changes into another, heat is gained or lost. These changes in heat can be measured.

2. Condensation (dew) may form on anything that has a temperature which is lower than the dew point of the air that touches it, if the temperature at which condensation is taking place is above 32° .

3. When ice is placed in water, heat from the water is given off into the air. The temperature of the water decreases until it reaches freezing temperature (32°).

4. Evaporation is a cooling process during which temperature decreases.

5. Frost will form if the temperature at condensation is below 32° .

6. When heat is removed from water, it gets steadily colder until it reaches 32° . The water stays constant at this temperature until all of the water is frozen. Temperature begins to drop again if more heat is removed.

7. When salt is mixed with ice in a container, the temperature of the mixture drops low enough to cause an inserted test tube partially filled with water to freeze solid, although the mixture surrounding the test tube becomes less solid.

Experiments

1. Measure changes in temperature from room temperature to ice-in-water to boiling point.

Place the thermometer in the overflow can, one-half filled with water which has been allowed to stand at room temperature for several hours. Leave the thermometer in the water until the temperature reading is constant. This is water at room temperature. Record it. (a) _____.

Put several pieces of ice in the can and stir. When the temperature is constant, record it. (b) _____.

What happens to the temperature of the water as the ice melts?

(c) _____

How low does it go? (d) _____.

Heat the container slowly stirring the mixture. Take the temperature at intervals until all of the ice is melted and the temperature again remains constant. What happens to the temperature of the water after the ice has melted? (e) _____

How high does the temperature go? (f) _____

Additional Experiments

1. Place several pieces of ice in a beaker (glass container) of water. Stir the mixture. Examine the outside of the beaker to determine at what temperature the first mist of drops of water appear. Record the temperature. What is the explanation of the appearance of the mist?

2. Put three parts of cracked ice and one part salt in the overflow can. Submerge all but one-fourth of a test tube partially filled with water in the can. Insert the thermometer in the test tube. Observe and

record the temperature every half minute until the content is several degrees below freezing. Does the water keep getting colder while it is freezing? At what temperature reading does it remain constant? Why?

Examine the frost on the outside of the overflow can. What is the explanation for its appearance?

When the test tube is removed from the can and the thermometer is removed from the test tube, measure the temperature of the contents of the can. Compare the lowest temperatures of the test tube contents with the lowest temperature of the contents of the can. Which is lower? Why didn't the mixture in the can freeze solid? Explain.

Overflow and Catch Cans

Concepts and Generalizations

1. Two objects cannot take up the same space at the same time.
2. The apparent loss of weight of an object placed in a container of water is equal to the weight of the liquid displaced.
3. Specific gravity is the weight of an object divided by the weight of an equal volume of water. It is the ratio of a solid or liquid to the density of water.
4. If the density of an object is greater than that of water, the object sinks.
5. If the density of an object is less than that of water, the object floats.
6. Fluids push up on objects immersed in them. Buoyancy is the name given to this force.

Exercises

1. Fill the overflow can. Place the catch can under the spout. Lower an object into the can. The amount of water displaced by the object is the volume of the object, when its density is greater than that of water.
2. What is the specific gravity of water? Which of the $1\frac{1}{4}$ inch blocks have specific gravities greater than water? Which blocks float? Which ones sink?
Using the spring balance —
3. Weigh those blocks with specific gravities greater than water. Record the weights. Using a string attached to the spring balance, weigh each of these blocks in water. Record the weights. The weight of the block in the air less (minus) the weight of the object in water should equal the weight of the water displaced by the block. Check the weights of each to determine if this is true.
4. Explain Archimede's principle. Using the appropriate blocks, illustrate this principle.

SEATED PARQUETRY SET



Manufactured by

American Printing House for the Blind

1839 Frankfort Avenue

P. O. Box 6085

Louisville, Kentucky 40206

SEATED PARQUETRY SET

Parquetry has long held a place among educational and recreational activities for normally seeing children and is always available in many forms through commercial sources. The IMRC/APH developed its parquetry set for low-visioned children to provide formboards which control the work space and hold individual pieces seated even if elevated at an angle of considerable degrees. Field-testing has shown that the seated formboards ease the manipulative task of students and that they are more readily accepted by students having lesser amounts of vision. Cooperating teacher-observers felt that the use of the seated formboards contributed to the students' independent work skills. It was agreed that the stimulus cards and the accompanying seated formboards provide a vehicle which required students to actively use their vision, but allowed better posture than might be maintained otherwise. In addition, frustrations which might result from random hand movements or from factors related to low vision were kept to a minimum.

The intent of the IMRC/APH staff was to contribute to the nation-wide effort in the Utilization of Low Vision. In addition to the ULV Kits (APH Cat. Nos. 8-5059 and 8-5060) already made available through APH, this Seated Formboard Set would provide for the low-visioned child an accepted educational device in a form more suited to his needs. However, in planning procedures and activities in relation to each formboard and stimulus card, it becomes apparent that visual stimulation is but one purpose for which creative teachers may find the Seated Parquetry Set useful.

The colors used on the stimulus cards and the parquetry pieces have been matched in every quality as nearly as possible, so that neither the knowledge of names of colors nor the concepts of color are necessary for a child to perform in initial attempts at visual stimulation. Yet, advanced concepts in specific curriculum areas are possible, as are many opportunities for language development.

CONTENTS OF SET

Contents of Set:

- 10 Formboards (30-mil high-impact styrene) — white; $8\frac{3}{4}$ inches square; with 3 rounded corners and 1 notched corner.
- 10 Stimulus Cards (20-mil high-impact styrene) — white; 7 inches square; small circle in one corner to identify with

notched corner of formboards; designs in colors to match parquetry blocks.

144 pieces of TACTILMAT® — non-toxic, non-breakable, washable. The 144 pieces consist of 24 pieces each in 6 different colors (red, yellow, blue, green, purple, and brown). Each color includes 4 pieces each of 6 different geometric shapes (square, right triangle, rectangle, acute isosceles triangle, obtuse isosceles triangle, and rhombus or “diamond”).

The pieces of TACTILMAT® come die-stamped in sheets, one for each color, except brown which is in two half sheets. It is suggested that the resulting “frames” not be discarded when the individual pieces are first removed, since they can be used as sorting zones for organizing work areas, as set dividers, and so on.

Seated Parquetry Set. (sold in complete sets only). **Cat. No. 1-0365.**

®Trademark of Ideal School Supply Company, Oaklawn, Illinois.

GENERAL SUGGESTIONS

Discover the difference in the feel of the two sides of each piece of parquetry. One side is smooth and the other is rough. Note that materials in the environment (clothes, curtains, towels) differ on the two sides. Play with pieces of the same shape to determine if these particular shapes are the same or not when the sides are reversed and/or the pieces are changed in position. Using the stimulus card which has blue and green squares and triangles, have the child hold the card in one hand. Give the child a blue square of parquetry in the other hand, asking him to cover a similar figure on the card. Exchange parquetry pieces, one at a time, repeating the idea of finding “where it belongs.” Holding one piece at a time in contact with the card, without the use of a working surface, will reinforce the concept of moving the work TO the eye instead of “bending the body” to the task.

Using the formboard that has sets for 3 squares, have the child hold the Seated Formboard in his hand while he is handed, one at a time, 3 squares (a green, a yellow, and a brown). These may be placed in any arrangement. As the child places these, the teacher will be able to observe his manipulative ability and the visual distance at which he needs to work. Together then, teacher and pupil can plan his place of work/play for comfort

and efficient functioning. The child may need a desk easel (such as the APH Desk Reading Stand, **Cat. No. 1-0322**) to elevate the formboards; he may need to work near a window to distinguish colors; or he may need to change his entire work position and procedure because of the way he must hold a stimulus card. For example, a right-handed child attempting to seat parquetry while holding a stimulus card close to his right eye might well be discouraged.

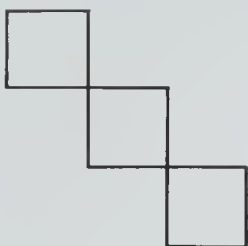
From the beginning, the child should establish his way of arranging, separating, and putting into order the parquetry pieces not in use at the moment. Stacking, boxing, putting in "sets" by shape and/or by color will aid in finding the desired piece, will reinforce continuously the identity of shapes and color, will give an awareness of lost pieces, and will help in establishing orderly work techniques.

Each time the stimulus card and formboard are to be used together, the child must be made aware of the need to position them identically, according to each child's maturity, handedness, and other factors. Procedure for making certain of this must be planned.

The following "Suggestions For Use of Specific Stimulus Cards and Formboards" are sampling clues only, directed to the teacher. While the underlying purpose for each activity is having the low-visioned child use his vision, the teacher needs to be aware of possible approaches. Both easy tasks and more difficult tasks are included. For example, tasks which require no concepts (only visual performance) are given for use with pre-schoolers and the mentally-retarded while tasks involving concepts gained only in advanced mathematics and social studies courses are included for the older student who may be participating in visual stimulation efforts for the first time and might not be challenged to LOOK if an approach too elementary for him were used.

Tasks include areas of visual discrimination, position in space, part/whole concepts and visual memory. Others are possible. Obviously, each teacher will adjust the approach and rhetoric according to the individual child's needs for best motivation just as she will ignore, include and expand the ideas according to her creativity, time and energy.

SUGGESTIONS FOR USE OF SPECIFIC STIMULUS CARDS AND FORMBOARDS



This stimulus card introduces 3 colors (green, yellow, brown) and 3 shapes (square, rectangle, right triangle). With young children, perhaps none of these will be mentioned, as such.

Easy Tasks:

Duplicate design.

Count pieces as they are removed.

Fill the formboard with just 3 pieces, all the same color. (May need to give clue as to change of shape.)

Find the middle one and take it out (remove it). Put in 2 small pieces where the middle piece was. (Observe if arrangement on stimulus card is duplicated.)

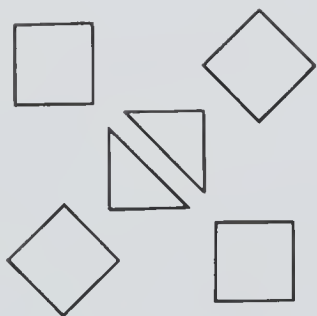
More Difficult Tasks:

Reverse the colors, using only triangles.

Duplicate the color pattern on the stimulus card but use only rectangles arranged vertically.

Where green is on the card, use red right triangles with the resulting diagonal in a northwestern/southeastern direction; where the yellow is, use yellow triangles, reversing the diagonal; where the brown is, duplicate the position with blue.





This stimulus card and form-board present 2 colors (blue and green) and 2 shapes (square and right triangle). The green squares have been changed to a position more commonly expected of the rhombus ("diamond"). (Later, when the rhombus is introduced, the difference may be noted with older children). The triangles have been moved apart to further the concept introduced in the

previous card.

Easy Tasks:

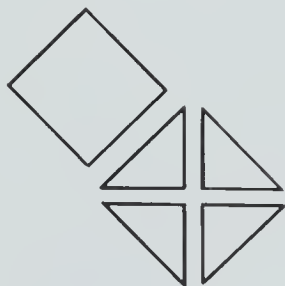
Duplicate design.

"Swap" the 2 middle pieces.

Take out the 2 big pieces at the top and swap (exchange) them.

More Difficult Tasks:

Replace the upper left square with 2 blue right triangles; replace the 2 center triangles with red triangles; replace the lower right square with 2 blue triangles; replace the north-east corner square and the southwest corner square with yellow triangles.



This card and board present only 2 colors (yellow and purple) and 1 shape (acute isosceles triangle).

Easy Tasks:

Duplicate design.

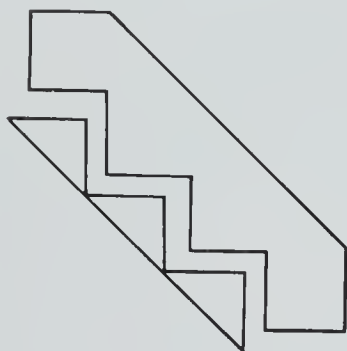
Discuss how the two parts of the stimulus card are different (closed vs. open; part vs. whole).

Put all of same color in each part. (Observe how many moves are required. Are the moves "by accident" or "planned"? Are false moves repeated or begun and rejected?)

More Difficult Tasks:

Compare triangles of this card and formboard with the triangles of the card and formboard just before this. (Same size?)

On this card, how many triangles are required to make the square? On the previous card, how many were required? The ratio of the areas of the 2 squares is what? (2:1 or 1:2)



Two shapes (square and right triangle) and 3 colors (yellow, blue, green) are presented. The concept of closure and part/whole is continued with same sizes and shapes used in the 2 previous cards.

Easy Tasks:

Duplicate design.

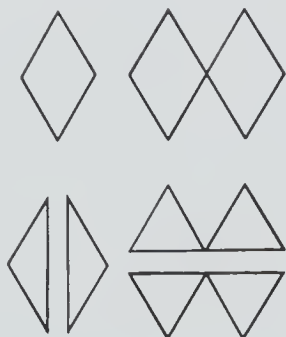
Count the smaller pieces (must be 6).

Take out the larger pieces and put some of another color in their places.

More Difficult Tasks:

Tell how the figure would look if the lower triangles were pushed into place among the squares. Now draw it (free hand) in outline or silhouette.

Remove the squares; choose 4 right triangles in each of 2 colors; place them with the darker triangles forming the lower-left half of each of the blocks and the lighter triangles forming the upper-right half of each of the blocks.



Three shapes (rhombus or “diamond”, obtuse isosceles triangle, acute isosceles triangle) and 2 colors (green and purple) are used. Closure and part/whole concepts with vertical and horizontal are continued from previous experiences in the series.

Easy Tasks:

Duplicate the design.

Count (or point to) the larger blocks. (3)

Count (or point to) the other blocks. (6) Are all of these other blocks alike? (NO)

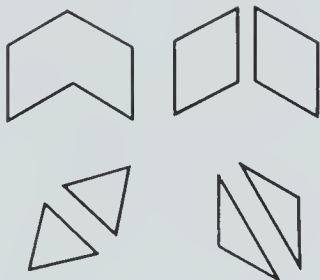
Take the larger blocks out.

See if the smaller blocks (ALL of them) can be put into the same places from which you took the larger blocks.

More Difficult Tasks:

Compare the 3 whole figures at the top with the figures in the lower-left and upper-right corners of the second card and formboard used.

Note the differences in the rhombus pieces and the square pieces. Is it the length of the sides that makes the difference? (NO) What? (Size of angles) compare blocks.



The shapes (rhombus and 2 types of isosceles triangles) are again used, this time in green and red. Different positions are shown, giving an additional part/whole design and showing more clearly the relationship between rhombus and parallelogram. Again compass directions can be related to the diagonals.

Easy Tasks:

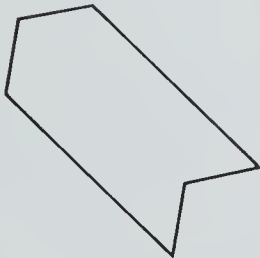
Duplicate the design.

Remove the 2 darker (red) blocks from the top line (row).

Put into those two places (seats) the 2 blocks that are exactly like the other two on that top row.

More Difficult Tasks:

Remove all the blocks and turn stimulus card down on the table (desk) so that the design is not seen. Now, select blue blocks and fill the spaces formerly held by the red. Then, choose another color to fill the spaces formerly held by green. Check memory by looking at the stimulus card.



The shapes remain the same as in the former card and board. The colors used are red and yellow. The part/whole concept is further illustrated.

Easy Tasks:

Duplicate the design.

Point to the biggest dark (red) block.

Remove the 3 pieces that are the same shape and color.

Choose another color and fill those spaces.

What does this look like?

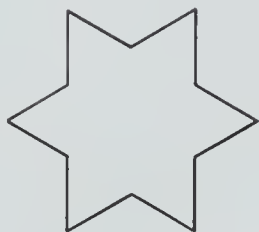
More Difficult Tasks:

Replace the triangular blocks with rhombus blocks of the same color.

The 2 colors here are primary colors. What is another one? Use it to replace the yellow.

Interchange the blocks so that the design consists of 2 solid stripes or halves.

On a sheet of paper, duplicate the colors as they now are *except* you are to point the design toward the upper-right corner instead of toward the upper-left corner. (This is to be done without turning the paper or moving it, once you have started.) Duplication may be done by blocks placed on paper or by drawing with crayons.



Only 2 shapes (rhombus and obtuse isosceles triangle) and 2 colors (yellow and blue) are used. The concept of part/whole is continued and sequencing is demonstrated.

Easy Tasks:

Duplicate the design.

Do NOT remove any blocks, but using 2 more large blue and yellow blocks like the ones you have, cover the small blocks.

Did you place them so that the colors go from one to the other each time (alternate) or did you have 2 of the same color next to each other?

Remove all blocks from your formboard. Choose big blocks and fill the whole star.

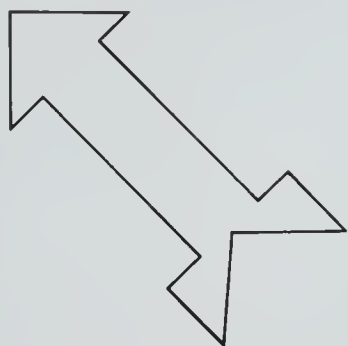
Can you count the points?

If 2 colors were not chosen and alternate sequencing were not done, plan and direct until the concept is understood, according to the child's ability. (*Note:* Be sure to sequence clockwise, which is actually left to right.)

More Difficult Tasks:

Do NOT duplicate the design. Look carefully at the stimulus card. Turn it down. Then produce the design, one point over in the clockwise direction. Check yourself by comparing the card and your design.

Select a light color and a dark color, using one rhombus and 4 obtuse triangles in each. Then, beginning at the westernmost point, with the darker rhombus, recreate the design.



This "arrow" uses rectangles and right triangles, both of which are halves of the squares included in the set. The 3 primary colors (red, blue, yellow) are used.

Easy Tasks:

Do NOT duplicate the design first.

Looking at the stimulus card, point to the big blocks (triangles). (It may be necessary to hand child 1 triangle and have him fit it over the 4 on the card.)

Point to the smaller blocks that are the same color as the ones just counted.

Cover the rectangles with 3 squares. (Adult will need to hand the squares and demonstrate for the very young.)

Show the way the arrow points, with hand.

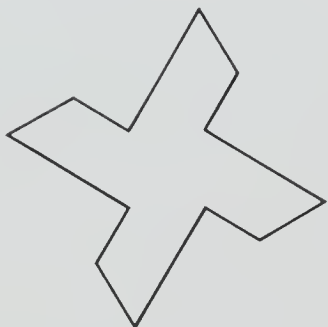
What is the other end of the arrow called?

Duplicate design.

More Difficult Tasks:

Describe the kinds of blocks used, giving shapes, colors, and numbers of each.

Are there 3, 4, or 5 triangles? Why do you make that choice? (2 triangles are in the point which is itself another triangle. Discuss counting as 1, 2, or 3).



This “windmill” design consists of 2 colors (yellow and brown) and 4 shapes (rhombus, its two kinds of triangular halves, and rectangle).

Easy Tasks:

Duplicate the design.

Create your color and block patterns.

More Difficult Tasks:

Duplicate the design, naming each geometric shape as the block is handled.

Using any colors and combinations you wish, create new designs, to be used with this formboard. Plan and record (in media of your choice) directions which can be followed by another. Use at least three steps in these directions. (The media may be verbal, written, recorded, painted or drawn, cut and pasted.)

SENSORY CYLINDER SET



Manufactured by

American Printing House for the Blind

1839 Frankfort Avenue

P. O. Box 6085

Louisville, Kentucky 40206

SENSORY CYLINDER SET

DESCRIPTION

The Sensory Cylinder Set is composed of six fiber cylinders ($2\frac{1}{2}$ " in diameter, 3" high). These cylinders have been weighted so as to produce three pairs of weights (300, 200, and 100 grams). Plastic styrene and fabrics have been placed in the recessed tops (or bottoms) of the cylinders, affording six textured matches. The fabric textures are in secondary colors of orange, purple and green; the plastic styrene textures are white. The sides of the cylinders are black. The cylinder set has been so designed that no two matches of weight, texture or color can be made simultaneously. Cylinder features are arranged in the following order:

	Weight (grams)	Hard Texture	Soft Texture	Color
1.	300	Smooth	Velvet	Green
2.	200	Smooth	Cotton	Purple
3.	300	Rough	Satin	Purple
4.	100	Rough	Cotton	Orange
5.	200	Medium	Velvet	Orange
6.	100	Medium	Satin	Green

Suggested Uses:

The Sensory Cylinder Set is recommended for use by the preschool-early primary level child or the older child with multiple handicaps. Tasks may include the following:

1. Tactual Discrimination
 - a. hard textures
 - b. soft textures
 - c. shape
2. Weight Discrimination
 - a. matching
 - b. determining heavier, lighter (gross differences)

3. Color Discrimination
 - a. matching same colors
 - b. presenting different shades of same color
4. Number Concepts
 - a. counting
 - b. adding
 - c. subtracting
 - d. beginning multiplication (concepts of 2's, 3's)
 - e. beginning division concepts
5. Language Concepts
size, color, shape, same, different, top, bottom, soft, smooth, rough, medium, etc.
6. Manipulation
 - a. stacking
 - b. rolling

Evaluation tests revealed the following order of difficulty (easiest to hardest) in discriminating like and unlike features:

1. Hard Texture
 - (1) Rough-Rough
 - (2) Rough-Smooth
 - (3) Medium-Medium
 - (4) Smooth-Medium
 - (5) Smooth-Smooth
 - (6) Medium-Rough
2. Soft Texture
 - (1) Cotton-Cotton
 - (2) Velvet-Velvet
 - (3) Satin-Velvet
 - (4) Satin-Satin
 - (5) Velvet-Cotton
 - (6) Cotton-Satin
3. Weight (grams)
 - (1) 300-100
 - (2) 100-100
 - (3) 300-300

3. Weight (grams) (Continued)

(4) 100-200

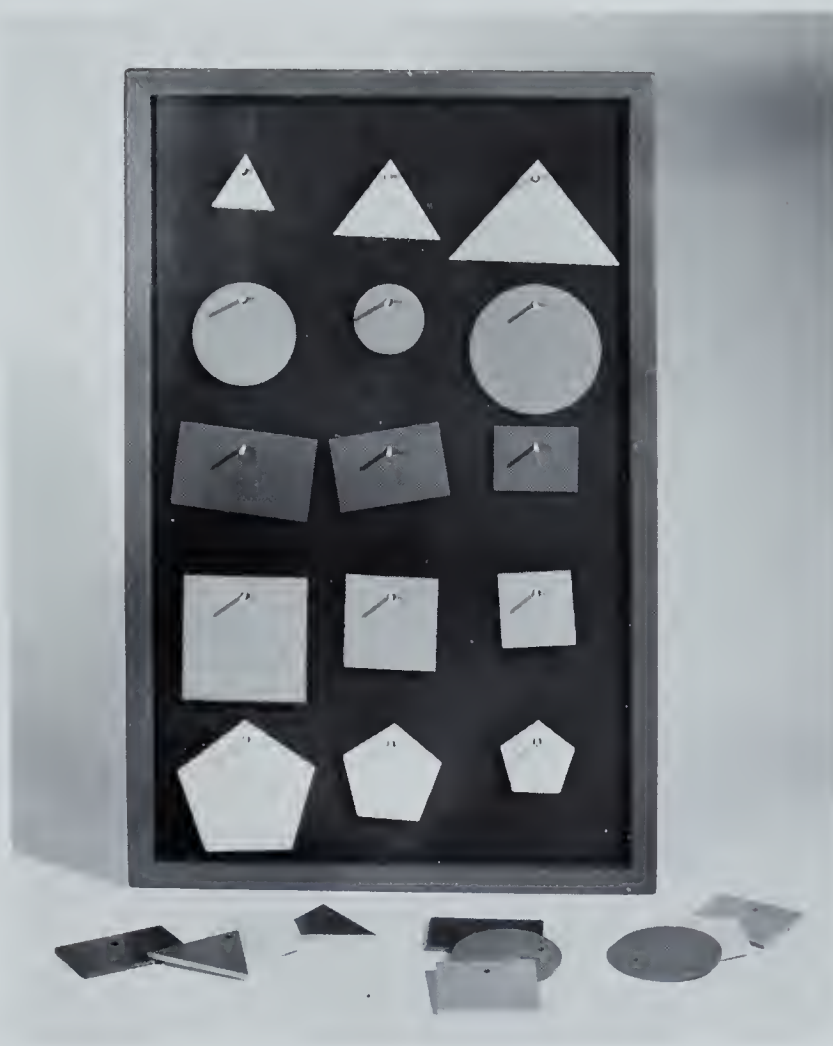
(5) 200-200

(6) 200-300

The Sensory Cylinder Set is designed so that it can be used in combination with the APH Peg Kit (Catalog No. 1-0342) for expanding educational possibilities. The APH Work-play tray (Catalog No. 1-0375 or 1-0376) may be beneficial as a contained workspace when these aids are being used.

Catalog No. 1-0367

SHAPE BOARD



Manufactured by

American Printing House for the Blind

1839 Frankfort Avenue

P. O. Box 6085

Louisville, Kentucky 40206

SHAPE BOARD

The Shape Board consists of a tray with three rows of five pegs each, on which are hung flat pieces ($\frac{1}{8}$ " thick) of five different shapes, and of three relative sizes — large, medium, and small. The outside measurements of the tray are $22\frac{1}{2}$ " x $14\frac{1}{2}$ ", with a ledge around the edge $\frac{3}{4}$ " wide x $\frac{3}{8}$ " deep, thereby providing a working space 21" x 13", with total weight of tray $2\frac{3}{4}$ pounds. The fifteen pegs are approximately $\frac{3}{4}$ " high.

Five different shape forms are included: Circles, triangles, squares, rectangles, and pentagons (five-sided). For each shape, five pieces are provided, one each of the large and small sizes, and three each of the medium size. While all pieces are painted a flat grey on the back, all those of a particular shape are painted the same color on the front — the circle, blue; the triangle, bronze; the square, orange; the rectangle, red; and the pentagon, yellow. The front and back surfaces of all shapes are constant to the touch.

The purpose of this device is to provide the primary-elementary level child with the opportunity to discriminate, sort, and classify different shapes on several bases, i.e., shape, size, like or different, color, and so on.

Contents of Set:

1 tray

5 shapes (each containing 1 large, 1 small, and 3 medium-sized pieces each):

Circles — painted blue.

Triangles — painted bronze.

Squares — painted orange.

Rectangles — painted red.

Pentagons — painted yellow.

Shape Board (sold in complete sets only). Cat. No. 1-0371.

Suggested Uses:

1. First, give the child all of the pieces to play with as toys — stacking, dumping, and restacking. If he recognizes differences in shape, encourage him to stack by shapes. If he recognizes differences in size, encourage him to point out the differences. If he has useful color vision, encourage him to sort on a color basis.

2. Begin to develop understanding of “like” and “different” (re: color, shape, size — one concept at a time) through appropriate use of the terms. For example, ask the child to select the one color of three that is different, the two shapes of three that are alike, the one size of three that is different.

3. Starting with the largest of one shape, for example the circle, discuss its name and characteristics. Then introduce the other sizes of the same shape (medium and small). Show him the hole in each piece and how to hang the shapes on the pegs of the board. Place three pieces of the same shape on the board, and ask him to remove the largest, then the smallest, then the medium-sized piece. Repeat with all shapes over a period of time.

4. Begin to develop understanding of such terms as “row,” “top,” “bottom,” “side,” “under,” “over,” “beside,” “above,” “beneath” — through their use, with explanation as needed. “Left” and “right” understandings will come later, and can be encouraged through helping the child know first his own body in terms of left and right.

5. Make numerous relationships between the terms mentioned in No. 4 above as applied to the child’s use of the shape board and terms used in other practical ways, such as “under the table,” and “beside the chair.”

6. Mix three shapes on the board, at first using *all* large, or *all* small, or *all* medium-sized. Ask the child to remove a certain shape, e.g., the square, to determine his understanding of shape-name relationship. Eventually, use the three rows of pegs and

mix sizes of several shapes, until the child shows understanding of the shape-name, regardless of the size differences. Initially, if the child has useful color vision, the shapes should be placed on the board with the brightly-painted front sides showing. As soon as possible, however, the child should learn to recognize the shapes independent of their distinctive colors, or with the gray sides showing.

7. The above activities should supplement the teacher's creative use of this instructional aid. Free play and times when several children are interacting afford other opportunities for incorporating the shape board into the learning process.

Visual abilities are not essential in the use of the shape board, and it may be enjoyed by children whether or not they are visually impaired. However, holding things close to the eyes indicates visual interest and awareness on the child's part, and such use of residual vision should be encouraged and developed.

As the child is guided in the use of the shape board, attention should be devoted to the expansion of his vocabulary. First, talk to him in terms or words he understands. Then add new words, making certain that the child develops an awareness of the concept or meaning of each new term.

SHOELACE AID

(Designed to Teach Shoelacing and Tying)



Manufactured by

American Printing House for the Blind

1839 Frankfort Avenue

P. O. Box 6085

Louisville, Kentucky 40206

SHOELACE AID

The Shoelace Aid consists of a wooden frame shaped like a high-top shoe, but open at the back so a child can put his foot into it, with 2 vinyl-coated-cloth lacing flaps with 4 eyelets on each side, plus two kinds of laces. The overall dimensions of the shoe are 5" high x $8\frac{1}{4}$ " long x $3\frac{3}{4}$ " wide. Inside measurements are $4\frac{7}{8}$ " high x $8\frac{1}{4}$ " long x $3\frac{1}{4}$ " wide — big enough to take a size $13\frac{1}{2}$, D-width, thick-soled child's (both boys' and girls') shoe. The wooden part of the shoe is painted a bright blue, with the vinyl-covered-cloth flaps approximately the same color. The eyelets are made of white metal and have holes $\frac{1}{4}$ " in diameter. Two laces are provided: (1) Made of white nylon cord, $\frac{1}{8}$ " in diameter x 43" long, with 1 smooth and 1 textured tip, each $1\frac{3}{16}$ " long; (2) A regular white knitted cotton shoelace, $\frac{1}{4}$ " wide x 40" long, with regular tips.

The purpose of the Shoelace Aid is to teach shoelacing and tying to kindergarten and elementary grade children, as well as others who are in need of developing muscular coordination and manual dexterity.

Contents of Set:

- 1 wooden shoe frame
- 1 white nylon lace, with 1 smooth and 1 textured tip
- 1 regular white cotton shoelace

Catalog Numbers:

- | | |
|--|-------------------------|
| Shoe Kit (sold in complete sets only.) | Cat. No. 1-0380. |
| Replacement Nylon lace. | Cat. No. 1-0381. |

Suggestions for Use:

A distinctive feature of the Shoelace Aid is that it provides for the teaching of lacing and bow-tying on a simplified basis, but in the normal shoe position. Most children can put their own

foot into the Shoelace Aid, and, because of the shoe's size, no great amount of exacting dexterity is required during the learning process. In addition to allowing the shoe to be put on, the open back affords good working room for both the teacher's and the child's hands.

The tips on the nylon lace can be referred to as "smooth" and "textured" (or "rough"), thereby simplifying verbal instructions. All lacing and tying techniques can be used with this shoe. Methods and instructions for both lacing and tying will vary with both the teacher and the particular child's needs,* but the following outline can guide the teacher in the use of the shoe:

1. Guide the child in examining the shoe. Identify the following:

- a. Opening in the back of shoe; the toe; the sides; the sole; the lacing flaps.
- b. Eyelet holes in flaps (let child count these).
- c. Nylon lace (note the differences in tips).

Have the child compare this shoe to his own. (If he does not wear laced shoes, let him examine a shoe that does lace.) Show him how he can place his foot into the Shoelace Aid

2. Using the round, nylon lace, teach the lacing process with the shoe on a table or flat surface of a height which facilitates easy manipulation for the child. A clamp or adhesive material on the bottom can be used to hold the shoe in place. The teacher should work from behind or beside the child with the toe of the shoe pointing away from the child's body — the natural wearing position. Instructions should be given in small, sequential steps, allowing the child to master each step before moving on to the next. As necessary, the child's hands should be guided by the teacher's in the teaching process.

*See manuals on self-help and daily-living skills for methods on shoelacing and tying.

3. Repeat the above process with the child's foot in the Shoe-lace Aid. (Note: At this point, the shoe should be on the floor, or on a low object, with the child assuming the natural position for shoe-lacing by stooping over the shoe from either a sitting or standing position.)

4. Teach bow-tying with the shoe in the same position as directed in No. 2 above.

5. Teach bow-tying with the child's foot in the shoe, and the shoe and child in the positions directed in No. 3 above.

6. Check to see if the child can do both lacing and bow-tying with the shoe on the table.

7. Have the child do the complete process with his foot in the Shoelace Aid, first with the nylon cord, and then with the cotton shoelace.

8. As soon as the child seems ready for it, teach him to lace and tie an actual shoe, following the suggestions given above, but making variations according to the individual child's rate of achievement. If the child has difficulty with his own shoe, use a shoe of a larger size.

SIMPLE MACHINES KITS



Manufactured by

American Printing House for the Blind

1839 Frankfort Avenue

P. O. Box 6085

Louisville, Kentucky 40206

SIMPLE MACHINES KITS

The Simple Machines educational aids were developed by the Instructional Materials Reference Center of the American Printing House for the Blind in order to present concepts related to scientific principles involved in the use of machines.

There are three kits. Kit I, The Pulley and Lever Kit, contains 29 parts which share a common platform. Kit II, The Inclined Plane and Screw Kit, contains 25 parts. Kit III, The Wheel and Axle Kit, contains 10 parts.

Each kit contains working models of simple machines and an instruction manual which provided the required theoretical information and a variety of experiments. We recommend that these kits be used at the fourth grade level and above. These experiments vary in degrees of difficulty. These kits may be ordered separately.

Contents of Kit I:

Pulley set

- 1) platform, 60.7cm x 40cm ($23\frac{7}{8}$ " x $15\frac{3}{4}$ ")
 - 1) support rod with four holes spaced 10cm ($7\frac{7}{8}$ ")
apart, 88cm x 1.2 ($34\frac{5}{8}$ " x $\frac{1}{2}$ ")
 - 1) crosspiece, 60.8cm x 0.99cm (24" x $\frac{3}{16}$ ")
 - 4) hook collars, 1cm ($\frac{3}{16}$ ") i.d.
 - 1) right angle clamp with holding screws, 8.4cm ($3\frac{1}{4}$ ")
 - 4) single track, mounted pulleys, 4cm ($1\frac{5}{8}$ ") i.d.
 - 2) tandem, mounted pulleys, 4cm and 2.7cm ($1\frac{1}{4}$ ")
 - 2) double track, mounted pulleys, 4cm
 - 2) tripple track, mounted pulleys, 4cm
 - 2) cut off clamps, 8.1cm ($3\frac{1}{4}$ ")
 - 1) rectangular wire connector, 1mm (0.4") diameter
 - 1) spring balance with gram and ounce scales
 - 5) lengths of cord with a metal hook at each end
- 1 set of weights
- 1) 1000gr

- 1) 500gr
- 2) 200gr
- 1) 100gr
- 1) 50gr
- 2) 20gr
- 1) 10gr

Lever set

- 1) lever bar with 61 holes spaced 1cm apart, 62.5cm ($24\frac{5}{8}$ " x 1")
- 2) slide holders and clips, with 3 flanges for mounting on lever bar
- 3) holding pins, 2.5cm long (1")
- 1) metric ruler

Contents of Kit II:

Inclined plane

- 1) long plane, 76.3cm (30")
- 1) short plane, 38.6 (15 $\frac{1}{4}$ "
- 1) standard, 49.7cm (19 $\frac{1}{2}$ " high
- 1) 4-wheeled wagon, 12.2cm x 6cm ($4\frac{7}{8}$ " x $2\frac{3}{8}$ "
- 2) pull cords, 79cm and 67cm (31" and 26 $\frac{1}{2}$ "
- 1) metric ruler, housed in base, 60.5cm (23 $\frac{1}{2}$ "
- 1) set of weights (See Kit I for description)
- 1) spring balance with gram and ounce scales
- 1) ruler with caliper guide, 30.3cm (1')
- 1) cut off clamp (See Kit I for description)

Screw

- 2) cylinders mounted on bases, with vertical grooves, 2.4cm and 1.6cm (1" and $\frac{5}{8}$ ") diameter
- 3) right triangles, with pitches A, B, and C
- 2) metal clamps open on one end
- 1) jackscrew, 5 threads to the inch, 10.7cm x 8.8cm base diameter ($4\frac{1}{4}$ " x 3 $\frac{1}{2}$ "
- 1) hexagonal metal base, 7.5cm ($3\frac{7}{8}$ "
- 2) lever rods, 20cm and 10cm ($7\frac{7}{8}$ " and $3\frac{7}{8}$ "
- 1) wooden bolt with bead marker, 10.4cm ($4\frac{1}{8}$ "
- 2) wooden nuts with bead markers, 3.2cm x 3.2cm x 1.5cm ($1\frac{1}{4}$ " x $\frac{5}{8}$ "

Contents of Kit III:

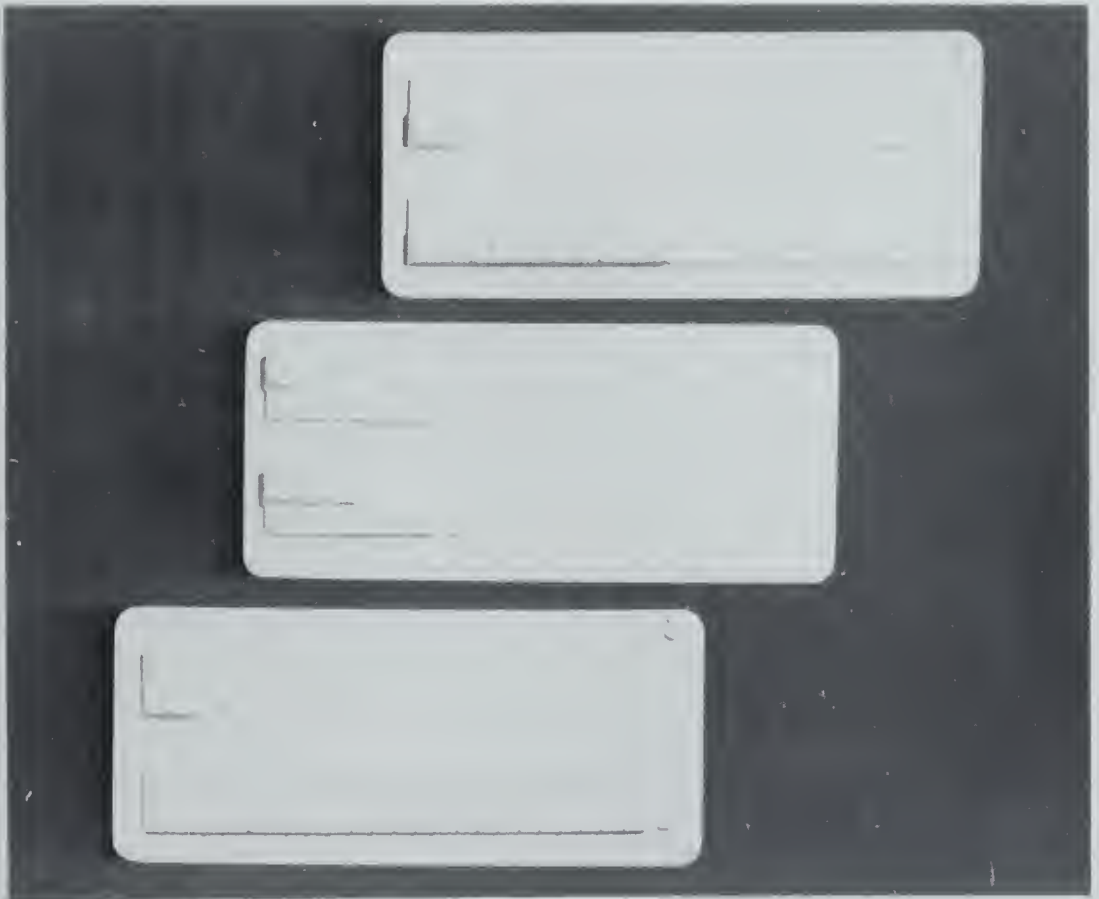
Wheel and Axle

- 1) platform support assembly:
 - 1) axle mounted in ball bearing housing
 - 1) cotton pin
 - 1) wooden frame support for axle
- 1) spoke, 12.6cm (5")
- 2) cords, 154cm and 102.5cm (61" and 40")
- 1) wheel, 5cm (2") i.d.
- 1) wheel, 10cm (4") i.d.
- 1) wheel, 15cm ($5\frac{7}{8}$ ") i.d.
- 1) wheel, 20cm ($7\frac{7}{8}$ ") i.d.
- 2) cut off clamps (See Kit I for description)
- 1) set of weights (See Kit I for description)
- 1) spring balance with gram and ounce scales
- 1) metric ruler

Catalog Numbers

- | | | |
|---------|----------------------------|--------|
| Kit I | (Pulley and Lever Set) | 1-0337 |
| Kit II | (Inclined Plane and Screw) | 1-0338 |
| Kit III | (Wheel and Axle) | 1-0339 |

TACTILE RULER FAMILIARIZATION UNIT



Manufactured by

American Printing House for the Blind

1839 Frankfort Avenue

P. O. Box 6085

Louisville, Kentucky 40206

TACTILE RULER FAMILIARIZATION UNIT

The Tactile Ruler Familiarization Unit was developed to introduce measurement concepts and operations to young primary level blind students. This aid consists of three vacuum formed plastic sheets 6½" x 14" illustrating English, Metric, and English - Metric measurement units.

On Sheet 1 there are two ruler segments each mounted on a raised base which is twelve inches in length. Example 1-A illustrates a one inch ruler segment which has a short raised line representing a one-half inch measurement unit and a long raised line representing a one inch measurement unit. Example 1-B illustrates a six inch ruler segment which has six short raised lines representing one-half inch measurement units and six long raised lines representing inch measurement units.

On Sheet 2 there are two ruler segments each mounted on a raised base which is ten centimeters in length. Example 2-A illustrates a one centimeter ruler segment having a short raised line representing a one-half centimeter measurement unit and a long raised line representing a one centimeter measurement unit. Example 2-B illustrates a five centimeter ruler segment having six short raised lines representing one-half centimeter measurement units and six long raised lines representing centimeter measurement units.

On Sheet 3 there is a ruler segment and a 12 inch ruler each illustrating English - Metric measurement units. Example 3-A illustrates a ruler segment with raised short and long lines designating one-half centimeter and one centimeter measurement units on the far edge of the ruler segment and one-half inch and one inch measurement units on the near edge of the ruler segment. Example 3-B is a 12 inch ruler with raised short and long lines designating one-half centimeter and centimeter measurement units on the far edge of the ruler and one-half inch and inch measurement units on the near edge of the ruler.

SUGGESTED ACTIVITIES FOR USE WITH THE TACTILE RULER FAMILIARIZATION UNIT

The unique design of this aid allows the teacher to introduce in a simple fashion the operations involved in performing a measurement task while introducing a concept (s). The following information specifies the concepts and operational tasks a primary level blind child should become familiar with while developing an understanding of the English and Metric Measurement Systems.

SHEET I - ENGLISH MEASUREMENT

Concepts

1. A ruler is a device used for measuring.
2. Measuring consists of identifying lengths.
3. Lengths may be measured in units of inches or centimeters.
4. The inch has a specific length.
5. The inch may be divided into two parts each called one half inch.
6. Two one-half inches combine to make one inch.
7. The short lines on the ruler segments are called one-half inch lines.
8. The long lines on the ruler segments are called inch lines.
9. The space between the left edge of the ruler segment and the short line is the length of one-half inch.
10. The space between the short line and the long line is the length of one-half inch.
11. The space between the left edge of the ruler segment and the long line is the length of one inch.
12. One-half inches and inches may be counted.

Operations

1. Examine Sheet I. Assist the student in systematically scanning the sheet.
2. Locate Example A. Examine the ruler segment and the base on which it rests.
3. Locate the left and right edges of the ruler segment.
4. Locate the short line and the long line.
5. Examine the space from the left edge of the ruler segment to the first short line.

6. Examine the space from the first short line to the first long line.
7. Examine the space from the left edge of the ruler segment to the first long line.
8. Label the short line, the one-half inch line and the long line, the inch line.
9. Locate Example B. Examine the ruler segment and the base on which it rests.
10. Locate the left and right edges of the ruler segment.
11. Locate and count all of the short lines.
12. Locate and count all of the long lines.
13. Examine all spaces one-half inch in length.
14. Examine all spaces one inch in length.
15. Count how many half-inches and inches appear on the ruler segment.

SHEET II - METRIC MEASUREMENT

Concepts

Use the same information listed above. Substitute centimeter for inch.

Operations

Repeat all operations as listed above.

SHEET III - ENGLISH-METRIC MEASUREMENT

Concepts

1. A ruler is a device used for measuring.
2. Measuring consists of identifying lengths.
3. Lengths may be measured in units of inches or centimeters.
4. One-half inch and inch units of measurement may be converted into one-half centimeter and centimeter units of measurement and one-half centimeter and centimeter units of measurement may be converted into one-half inch and inch units of measurement.
5. One-half inches, inches, one-half centimeters and centimeters may be counted.

Operations

1. Examine Sheet 3. Assist the student in systematically scanning the sheet.

2. Locate Example A. Examine the ruler segment.
3. Locate the short and long lines closest to the near edge of the ruler segment.
4. Examine the space from the left edge of the ruler segment to the first short line.
5. Examine the space from the first short line to the first long line.
6. Examine the space from the left edge of the ruler segment to the first long line.
7. Identify the measurement units as one-half inches and inches.
8. Locate the short and long lines closest to the far edge of the ruler segment.
9. Examine the space from the left edge of the ruler segment to the first short line.
10. Examine the space from the first short line to the first long line.
11. Examine the space from the left edge of the ruler segment to the first long line.
12. Identify the measurement units as one-half centimeters and centimeters.
13. Demonstrate the conversion process. Show the student the relationship between the two sets of lines. Move the students fingers up and down from the inch lines to the centimeter lines and vice versa.
14. Locate Example B. Examine the ruler.
15. Locate the lines closest to the near edge of the ruler. Identify the measurement units as one-half inches and inches.
16. Have student move his fingers from the left edge to the right edge of the ruler and locate all half-inch and inch lines.
17. Locate the lines closest to the far edge of the ruler. Identify the measurement units as one-half centimeters and centimeters.
18. Have the student move his fingers from the left edge to the right edge of the ruler and locate all half centimeters and centimeter lines.
19. Demonstrate the conversion process from inches to centimeters.
 - a. Place subject's finger on first long inch line. Subject converts to third short centimeter line.
 - b. Place subject's finger on sixth short inch line. Subject converts to fourteenth long centimeter line.

- c. Place subject's finger on the ninth long inch line. Subject converts to twenty-third long centimeter line.
 - d. Place subject's finger on seventh short inch line. Subject converts to seventeenth long centimeter line.
20. Demonstrate the conversion process from centimeters to inches.
- a. Place subject's finger on second short centimeter line. Subject converts to first short inch line.
 - b. Place subject's finger on eighth short centimeter line. Subject converts to third long inch line.
 - c. Place subject's finger on twenty-fourth long centimeter line. Subject converts to tenth short inch line.
 - d. Place subject's finger on tenth long centimeter line. Subject converts to fourth inch long line.

Catalog Number — 1-0383



TACTUAL AIDS FOR READING (TAR)



Manufactured by
American Printing House for the Blind
1839 Frankfort Avenue
P. O. Box 6085
Louisville, Kentucky 40206

TACTUAL AIDS FOR READING (TAR)

The TAR set of aids for use in developing beginning reading skills was developed by Instructional Materials Reference Center at the American Printing House for the Blind. The set consists of a collection of 175 objects, identified through extensive textbook analysis and evaluation as appropriate aids for use in beginning reading programs, and a pamphlet entitled "Guidelines for Teachers" which offers suggestions for using the collection.

The actual composition of the TAR collection of objects may vary at times because of the availability of certain items. Objects which are included in the collection will be those identified as being most acceptable through extensive evaluation by expert teachers of visually handicapped students. The collection contains objects in such categories as animals, fruit, vegetables, furniture, cars and trucks, etc. A complete list of the objects from which those contained in the collection are chosen can be found in the appendices of "Guidelines for Teachers."

CONTENTS OF SET:

- Collection of 175 objects
- 1 pamphlet, "Guidelines for Teachers"
- 4 containers, 13" wide, 9 1/4" high, 12 3/4" deep
with a shelf for each container which fits
horizontally across in the middle
- 4 drawer-type inserts for each container,
4" high, 6" wide, 12" deep

Additional containers may be purchased with each set, or separately.

SUGGESTED USES:

Surveys have shown that the majority of teachers of visually handicapped children use objects in beginning reading programs. It is generally felt that, when careful thought and consideration

are given to the purposes for which they are used, they can be highly effective educational aids. Therefore, it is suggested that teachers carefully consider the following purposes for the use of objects in teaching beginning reading:

1. To stimulate interest and curiosity about real things in the environment.
2. To develop an awareness of the purposes and importance of tactual discrimination.
3. To provide a variety of interesting and motivational activities for teaching specific reading skills, i. e., phonics skills.
4. To supplement or replace materials in ink-print texts which are highly visual in nature.

Catalog Number - 1-0374 - Complete Set

Additional Containers:

Catalog Number - 1-0373 - Container with 4 drawers

A TACTUAL ROAD TO READING



Manufactured by

American Printing House for the Blind

1839 Frankfort Avenue

P. O. Box 6085

Louisville, Kentucky 40206

A TACTUAL ROAD TO READING

A TACTUAL ROAD TO READING is a reading readiness program which was originated by Mrs. Ina Kurzhals, Utah School for the Blind, and produced under the auspices of the Instructional Materials Reference Center at the American Printing House for the Blind. It primarily is a program for children who will eventually use Braille as their reading medium. This program was designed to provide visually handicapped children with the materials they will need to learn to read Braille and to supply teachers with subject matter and techniques which have proved successful in the teaching of Braille reading. The program is fully explained in a guidebook which accompanies it and specific techniques for using the materials are contained in the lesson plans.

The complete set of materials consists of the following items:

1. A Guidebook which contains a statement of the origin and philosophy of the program, and a description of the materials contained in the program.
2. Five pamphlets, four containing lesson plans and one containing diagrams and patterns for making parts of the program materials which are a part of the program, but which are not produced by the American Printing House for the Blind. The pamphlets are organized into the following categories:

Pamphlet I—Learning through the Environment

Pamphlet II—Learning through Spoken Language

Pamphlet III—Learning through Hand Skills

Pamphlet IV—Learning through Books

Pamphlet V—Aid for Teachers

3. Thirty-six Tactual Readiness Books to be used by children. These books are organized into the following categories:
 - a) Analytical/Interpretive Books - Braille stories about things which have actually been experienced by children.

- b) Skill Books - designed to develop skills of following a line, locating items on a page, identifying shapes, etc.
- c) Library Books - interesting stories for children to read for fun.
- d) Structured Books - introduce sentences which carry over to the next line, paragraphs that carry over to the next page, etc.

Other Tactual Readiness Books which are a part of the program, but not produced by the American Printing House are:

- a) Texture Books - introduce children to the discrimination of textures, objects, etc, as well as providing them with books which contain toys and other things with which they are familiar.
 - b) Books of Objects - also contain textures and objects, but put more emphasis on discrimination.
 - c) Child's Own Books - books made by the children themselves.
 - d) The Surprise Book - introduces the use of phonics in a reading program. The book contains an envelope on each with an object for which the child has to give the beginning sound.
4. A Cassette Tape which contains a description of the program and its development by Mrs. Ina Kurzhals, originator of the program.

Suggested Use

A TACTUAL ROAD TO READING is a flexible program which is appropriate for use in a variety of situations. Listed below are some situations in which it can be used:

- 1. The program can be used by teachers in reading readiness programs for visually handicapped children.
- 2. The program can be used by parents, at home, to pro-

vide environmental experiences which develop concepts needed for later success in reading programs.

3. The program can be used by educators of multi-handicapped children who require direct and concrete experiences both in the environment and with educational materials.

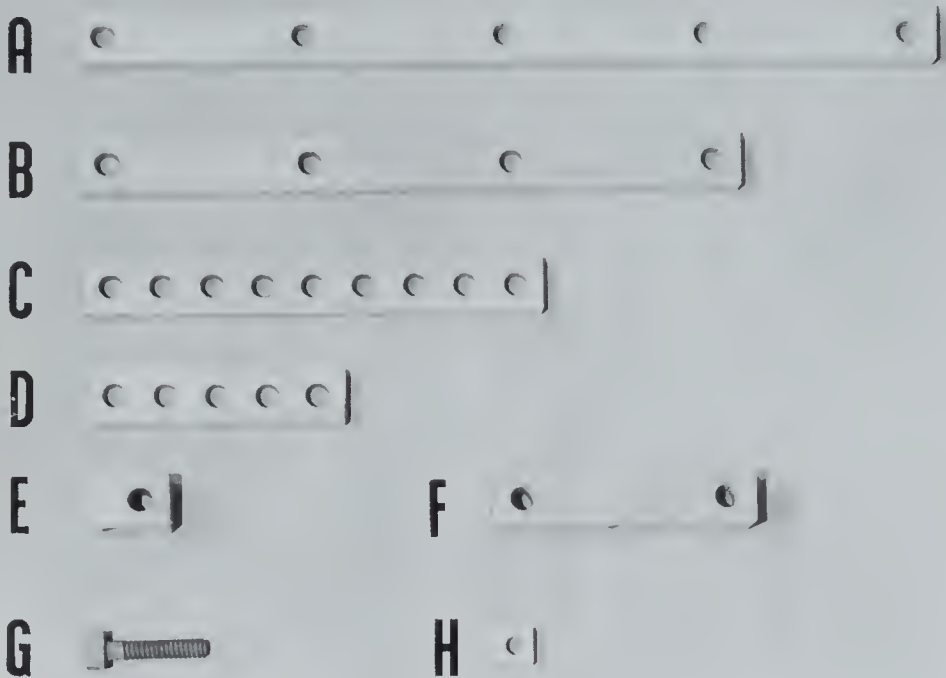
Catalog Numbers:

Teachers Edition—1-0345

Students Edition—1-0346

WOODEN CONSTRUCTO SETS

Junior and Senior Kits



Parts for Constructo Sets

Manufactured by

American Printing House for the Blind

1839 Frankfort Avenue

P. O. Box 6085

Louisville, Kentucky 40206

WOODEN CONSTRUCTO SETS

(Junior and Senior Kits)

The Wooden Constructo Sets are educational toys consisting of various lengths of hard wood (with holes bored at regular intervals) and a quantity of wooden bolts and nuts. The purpose of both models is to help the blind child develop muscular co-ordination; to give him practice in the development of manual dexterity and construction concepts; and to train his creative abilities by assembling the pieces into various types of structures. The devices are similar in design and purpose to the metal erector sets which have been available commercially for many years, but the pieces are made of wood and are much larger in size to enable the blind child to handle the pieces effectively.

There are two separate models: *The Junior Constructo Kit* for use by pre- and primary-school children making simple, basic assemblies; and the *Senior Constructo Kit* for elementary or older children wishing to make more elaborate constructions. The Junior Kit is composed of 38 pieces, $\frac{1}{4}$ the number found in the Senior Kit, and is packed in a black fibre-board storage box (24" x 5 $\frac{1}{4}$ " x 5 $\frac{1}{4}$ " in size) with a woven-strap carrying handle; the Senior Kit contains two more items (see A and F below) not found in the smaller set, and is packed in a wooden storage box (33" x 11" x 7" in size). Following is a list of the parts for each model. (See front page for picture of each piece):

	<i>Junior</i>	<i>Senior</i>
A. Wooden lengths $\frac{3}{4}$ " x 2" x 30"	—	8
B. Wooden lengths $\frac{3}{4}$ " x 2" x 23"	3	8
C. Wooden lengths $\frac{3}{4}$ " x 2" x 16"	2	10
D. Wooden lengths $\frac{3}{4}$ " x 2" x 9"	5	15
E. Right-angle joints 2" x 2" x 2 $\frac{7}{8}$ "	4	5
F. Right-angle joints 2" x 2" x 9"	—	4
G. Square-headed wooden bolts, $\frac{5}{8}$ " diameter, 4" long, painted red	12	50
H. Square-headed wooden nuts, painted yellow	12	50

Both Kits are sold in complete sets only, although replacement parts may be obtained upon request. *Write for prices.*

Catalog Numbers:

Junior Constructo Kit (38 pieces) — **Cat. No. 1-0369.**

Senior Constructo Kit (151 pieces) — **Cat. No. 1-0314.**

SOME SUGGESTED PROJECTS

JUNIOR CONSTRUCTO KIT:

The purpose of this kit is to develop muscular coordination, construction concepts, and inventiveness. Following are some suggested projects to use with a young child:

1. As a first step, let the child play with the several wooden lengths, pointing out the differences in length of the various pieces, as well as the differences in the number of holes in each. Encourage him to put his fingers through the holes. Point out the differences in weight of the various lengths. Show him how to put a finger through the holes of several pieces in combination at one time.

2. Give him the bolts to play with, and show him how to put the bolts through the holes, as he did his finger in No. 1 above.

3. Give him the nuts to play with, and to put his finger through the hole. Show him how to screw the nuts on the bolts, first part way, then all the way, and then to unscrew the nuts.

4. Give him 2 of the smallest wooden lengths and a bolt and nut and show him how to fasten the pieces together by joining them with a bolt and tightly screwed nut.

5. Show him how to construct a simple square, with 4 wooden pieces of the smallest length (D) and 4 nuts and bolts (G, H). (See diagram No. 1 on next page.)

6. Let him play with the right-angle joints, (E) putting his forefingers through both holes at the same time. Have him push bolts through both holes at the same time; then screw nuts on both bolts. Explain the differences in direction the bolts go through the solid.

7. Show the child how to join two wooden lengths (D) to a right-angle joint. Show him how to swing the wooden lengths around to make different effects. Urge him to do the same with longer lengths, or combinations of lengths.

8. Encourage him to make other variations of simple constructions, using all of the parts of the kit.



SENIOR CONSTRUCTO KIT:

The purpose of this kit is to give the somewhat older child, not only practice in the development of manual dexterity, but also help in developing and training his creative abilities.

1. As necessary, let him practice the operations suggested for the Junior Kit.

2. When he has accomplished these operations to his satisfaction:

a. Show him how to construct a square, using 4 wooden lengths (D), 4 right-angle joints (E), and 8 bolts and nuts (G, H). (See Diagram 2 above.)

b. Show him how to construct a triangle, using 3 wooden lengths (D), 3 bolts (G), and 4 nuts (H), using one of the nuts as a washer to fill in the space between the last two wooden lengths to complete the design. (See Diagram 3 above.)

3. For more complicated structures, show him how to build some of the designs shown on pages 5-8 or, more importantly, those of his own interest.



Construction Details



Turnstile



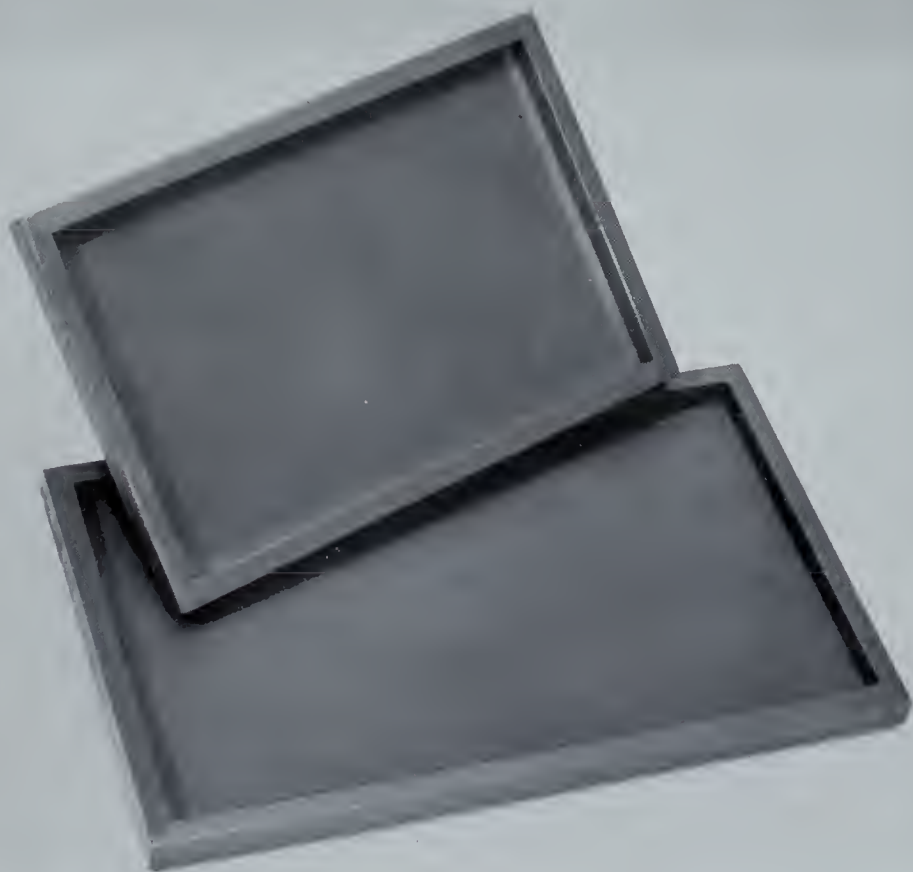
Rake



Railroad Semaphore



WORK-PLAY TRAYS



WORK-PLAY TRAYS

Manufactured by

American Printing House for the Blind

1839 Frankfort Avenue

P. O. Box 6085

Louisville, Kentucky 40206

The work-play trays are of two sizes, each designed to provide contained limits within which a child can work or play with toys and other materials. Either tray is small and light enough to carry it about as he pleases. Both trays have wooden frames which act as ledges extending 1" above the bottom working surface which is made of masonite. The larger tray is $22\frac{1}{2}$ " x $13\frac{1}{2}$ " x $1\frac{1}{4}$ " outside size, with an inner working area of 21" x 12" and weighs 2 lb. 4 ozs.; the smaller tray is 18" x 12" x $1\frac{1}{4}$ " outside size, with an inner working area of $16\frac{1}{2}$ " x 10", and weighs 1 lb. 10 oz. Both are painted gray. Rubber nailheads are fastened to the bottom of each of the four corners of each tray to prevent scarring of supporting surfaces of desk, table, or floor, and to eliminate slipping and sliding on smooth surfaces.

Suggested Uses (for parent, teacher, brother, sister, etc.):

1. Show the tray to the child in the way which makes the most sense to him. Give him the simplest kinds of toys, such as balls, to play with on the tray. As the child develops and progresses in ability to undertake increasingly difficult tasks, give him blocks, formboards, puzzles, and other simple objects to work and play with on the tray.

2. Placement and directional terms and concepts can be taught in relation to the tray. These, among others, should include: top, bottom; sides; middle; in, on; over, under; left, right; raise/lift/up, lower/drop/down; etc.

3. Unfinished work can be left on the tray, which can be removed "as is" and returned when child wishes.

4. Teach the child to carry the tray himself — at first, empty; then with only one non-rollable article on it, etc. — thus helping him to find himself increasingly able to care for most of his own needs.

5. Interspersed with the above activities, be sure that the child has time for free play with his tray:

a. Encourage his playing with other children, using the tray; encourage his creative use of the tray; be creative in your use of it with him. Remember that *all* children can enjoy using the tray, whether or not they are visually impaired.

b. Help the child to expand his vocabulary as you work with him in the various activities. Talk to him in simple, meaningful, broadening terms, and encourage him to use these terms. Through the use of meaningful vocabulary, the child learns to think and to do.

c. **Remember:** The child who has *little or no vision* must “look with his fingers”. The child who seems to have any useful vision at all, however, should be prompted to use it and shown how to do so. Holding things close to his eyes indicates visual interest and awareness on the child’s part, and he should be encouraged to use whatever vision he has.

Catalog Numbers:

Small Tray.

Catalog No. 1-0375.

Large Tray.

Catalog No. 1-0376.

